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ABSTRACT

The proceedings of the conference include background information, transcripts of opening and closing sessions, papers presented, a conference program, summary of discussions, findings and recommendations, and lists of committees and participants. The papers are divided into four sections: (1) goals and objectives of university education in developing countries, and specifically Asia; (2) characteristics and learning problems of college students in Malaysia, Indonesia, Singapore, the Philippines, and Thailand; (3) instructional problems and methods of overcoming them (case studies involving the Philippines, teaching microeconomics, the protocol approach, and teaching electronics); and (4) supportive infrastructure, academic staff training, and the use of educational technology for developing effective teaching-learning methods. (MSE)

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REPORT

INTERNATIONAL CONFERENCE ON TEACHING-LEARNING PROCESS IN UNIVERSITIES

June 12-16, 1979
Penang, Malaysia

THEME

A fresh look into the teaching-learning process and use of Educational Technology in Universities with special reference to ASEAN countries

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HE 012 685

Organised by
Universiti Sains Malaysia
Penang MALAYSIA

INTERNATIONAL CONFERENCE ON TEACHING-LEARNING PROCESS IN UNIVERSITIES

June 12-16, 1979

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Penang MALAYSIA

REPORT

Prepared by
The Editorial Committee

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BACKGROUND TO THE CONFERENCE

From 12 to 16 June 1979 an International Conference on the Teaching-Learning Process in Universities took place at the campus of Universiti Sains Malaysia, Penang. The theme of the Conference was "A fresh look into the Teaching-Learning Process and the use of Educational Technology in the Universities with special reference to ASEAN countries". It is the first conference of its kind in Malaysia which was organized by a local University in Malaysia for universities in the ASEAN countries.

Rationale

Why was it organized? What is the rationale behind such a Conference? It was observed that the scope of University Education has changed tremendously in recent years. Universities all over the world have begun to open their doors to a wide range of students with different academic qualifications, learning abilities and socio-economic background. These differences give rise to problems in the area of teaching and learning. Thus, reorganization of teaching techniques and methods with the aim of improving teaching effectiveness is urgently needed if we want to maximise students' potentials and abilities. Unfortunately, it is not uncommon for academic staff not to have professional training to equip them with the necessary skills and attitude for teaching and for using technology effectively to enhance teaching effectiveness. In trying to find solutions to these problems certain questions arise: What are the objectives of university education? How do we meet these objectives bearing in mind the nature of our students and their learning problems? What instructional strategies and infrastructure can we provide to raise the standard and effectiveness of the teaching-learning process"? These are some of the pressing questions which need to be raised and discussed pragmatically.

This being an international problem and affects both the developed and developing countries, it was thought that through an International Conference of this nature these various teaching-learning problems at university level could be thrashed out and possible solutions found for overcoming them. It was believed that the mutual sharing of ideas and experiences by people from various parts of the world could be invaluable in providing fresh insights into the problem as a whole. Indeed our hopes were realised to a great extent. Many useful findings and recommendations emerged as a result of the free sharing of ideas by both the Conference speakers and the participants as a whole. Moreover, the Conference had stimulated many university teachers and administrators to take a more critical and serious look at the teaching-learning process as well as the supportive infrastructure that their own institutions were providing for their teachers and students.

Objectives

Three broad objectives were drawn up, and they were as follows:—

1. To provide participants an opportunity to consider afresh the goals and objectives of university education and how best these goals could be achieved.

2. To help participants to become more aware of the teaching-learning problems in the universities.
3. To provide participants an opportunity to consider ways and means of increasing the effectiveness of teaching and learning through the use of educational technology.

Sub-Themes of the Conference

Based on the broad theme and the above stated objectives of the Conference the following sub-themes were presented and discussed:—

1. Goals and objectives of university education.
2. Characteristics of university students and their learning problems.
3. Instructional problems and methods or strategies used for overcoming them.
4. Supportive infrastructure, academic staff training and the use of educational technology for developing effective teaching-learning process.

Conference Programme

Over a period of five days a total of seventeen trend and working papers on the above sub-themes were presented by leading educationists and experts in the field of university teaching and learning and in educational technology. Speakers were invited from mainly the ASEAN countries, as well as a few from the more developed countries of the world like the United States of America, United Kingdom, Japan and Australia. For detail of trend and working papers please turn to the Appendices.

Besides the presentation of Conference papers, short relevant and useful speeches were made by the following at the opening ceremony:

Yang Berhormat Dato' Musa Hitam, Minister of Education, Malaysia.

Yang Berbahagia Tan Sri Datuk Haji Hamdan Sheikh Tahir, Vice Chancellor, Universiti Sains Malaysia.

Associate Professor Dr. Amir Awang, Chairman of the Organizing Committee.

These speeches were followed by the keynote address given by Yang Amat Arif Tun Dr. Mohamed Suffian bin Hashim, Lord President, Federal Court, Malaysia, who spoke on: "Goals and Objectives of University Education."

For the programme in detail please see page 18.

OPENING SESSION

Address by The Chairman of the Organising Committee, Associate Professor Dr. Amir Awang

Yang Berhormat Dato' Musa Hitam, Menteri Pelajaran Malaysia

Yang Amat Arif Tun Mohamed Suffian bin Hashim, Ketua Hakim Negara Malaysia dan Toh Puan Bunny Suffian

Yang Berbahagia Tan Sri Datuk Haji Hamdan Sheikh Tahir, Naib Canselor, Universiti Sains Malaysia

Yang Berbahagia Tan Sri-Tan Sri

Yang Berbahagia Datuk-Datuk

Naib Canselor-Naib Canselor Universiti tempatan

Tuan-tuan dan Puan-puan Para Jemputan dan Peserta yang sama Muliakan

Bagi pihak Jawatankuasa Penganjur Persidangan Antarabangsa mengenai Proses Pengajaran-Pembelajaran di Universiti-Universiti, saya ingin mengambil kesempatan ini untuk merakamkan setinggi-tinggi rasa terima kasih dan terhutang budi kami kepada Yang Berhormat Dato' Musa Hitam, Menteri Pelajaran Malaysia, di atas kesudian Yang Berhormat melapangkan masa untuk hadir di Majlis ini dan seterusnya merasmikan pembukaannya, walaupun kita sedar betapa sibuknya beliau dengan urusan-urusan negara yang maha penting. Kami juga merasa bertuah kerana Yang Amat Arif Tun Dr. Mohamed Suffian, Ketua Hakim Negara Malaysia, dapat hadir serta membentangkan Ucapan Perdana di dalam Persidangan ini nanti mengenai suatu tajuk yang tidak asing kepada beliau.

Memandangkan bahawa Persidangan ini dihadiri oleh perwakilan-perwakilan luar negeri, izinkanlah saya berucap seterusnya di dalam Bahasa Inggeris.

Ladies and Gentlemen,

On behalf of the Organising Committee, may I extend this warm welcome to all of you to Universiti Sains Malaysia Campus and in particular to this Conference. I hope you will have a pleasant and fruitful stay here.

The Organizing Committee feels most honoured and privileged to have with us this morning the Honourable Minister of Education of Malaysia, Dato' Musa Hitam, in spite of his heavy official and national responsibilities. His presence here this morning clearly marks his deep interest in and concern for the teaching-learning process in Universities. We hope his presence here this morning will further stimulate us to deliberate and ponder over questions of mutual interest.

We have also been very fortunate to have with us a person of great prominence, the Lord President Tun Dr. Mohamed Suffian Hashim. He has consented to deliver his Keynote Address to us on the subject of "Goals and

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Objectives of University Education" a subject which is becoming more and more important in light of the rapid changes that are taking place both in developed and developing countries.

The Organizing Committee has also been very fortunate in having a very supportive and understanding Vice-Chancellor. We would like to put on record our appreciation and thanks to you for your continuous support.

In addition, the Committee has received overwhelming support from various Organizations and persons such as: the Commonwealth Fund for Technical Cooperation, the Sabah Foundation, the IBM World Trade Corporation, the Asia Foundation, the Japan Society for the Promotion of Science, the Lee Foundation, the Toyota Foundation, the British Council, the Commonwealth Foundation, the Committee on Science and Technology in Developing Countries, the UNESCO, the Vice-Chancellor of Universiti Sains Malaysia, the Director of Regional Centre for Education in Science and Mathematics, the Principal of Malayan Teachers' Training College, the Airport Manager — Mr. Rajaratnam, the Ministry of Education, the Customs Department and the Immigration Department, who have contributed to a large extent to the success of this Conference. Without the generous support of all these Foundations and persons, I am afraid all our efforts would have not been realized.

While our primary aim at this Conference is to arrive at certain recommendations and proposals, let me suggest to you that you should also take advantage of the beautiful environment surrounding you in this beautiful island of Pulau Pinang. The Organizing Committee has made several arrangements for you to see places, to visit educational institutions and also to provide game facilities to those of you who cannot live a day without playing some games of one kind or another. Please feel free to contact any of us as listed in the souvenir programme if there is any need to do so. We will try our level best to extend to you the kind of hospitality which is characteristic of this country. I hope you will have a very pleasant and fruitful stay.

Thank you. May I now call upon the Honourable Vice-Chancellor to say a word or two.

Address by the Vice-Chancellor of Universiti Sains Malaysia, Y.B. Tan Sri Datuk Haji Hamdan Sheikh Tahir

Yang Berhormat Dato' Musa Hitam, Menteri Pelajaran Malaysia.

Yang Amat Arif Tun Mohamed Suffian bin Hashim, Pro-Canselor Universiti Malaya dan juga Ketua Hakim Negara, dan Toh Puan Bunny Suffian.

Yang Berbahagia Tan Sri Dato Ishak bin Haji Pateh Akhir, Pengerusi, Majlis Universiti Sains Malaysia.

Naib Canselor-Naib Canselor Universiti tempatan dan luar negeri.

Dr. Amir Awang, Pengerusi Jawatankuasa Pengelola.

Yang Mulia Tetamu-tetamu kehormat.

Profesor-profesor, Pensyarah-pensyarah, Tuan-tuan dan Puan-puan sekalian.

Saya sangat bersyukur kepada Illahi yang telah mengizinkan kita semua berada di Persidangan ini dengan begitu meriahnya beramai-ramai daripada dalam dan luar negeri. Bagi pihak tuan-tuan dan puan-puan sekalian, saya sukacita mengucapkan ribuan terimakasih kepada Yang Berhormat Dato' Musa Hitam, Menteri Pelajaran Malaysia, yang telah sudi datang memberi ucapan dan juga merasmikan pembukaan Persidangan kita, walaupun kita tahu dan sedar, yang beliau selalunya adalah dalam keadaan sangat sibuk dengan tugas-tugas besar negara setiap masa. Pada pagi yang bertuah ini juga, selepas upacara pembukaan rasmi, Y.A.A. Tun Mohamed Suffian telah sudi bersetuju menyampaikan "keynote address" kepada kita semua. Kepada Y.A.A. kami semua mengucapkan banyak terimakasih.

It is indeed my great pleasure as the Vice-Chancellor of Universiti Sains Malaysia to extend to you a very warm welcome to our University — and to this beautiful island of Penang. I hope that the enchanting island will act as a stimulant as well as catalyst to many hours of fruitful thinking and sharing of ideas, rather than a distraction. This is why the Organizing Committee has included in its programme a tour of the island. Penang is known for its natural beauty, simplicity and hospitality; so please feel free to make yourself at home while you are here.

As you already know the Conference theme is "A Fresh Look into the Teaching-Learning Process and the Use of Educational Technology in Universities with special reference to ASEAN countries". Judging from the wide interest shown, we can say that this Conference is a very appropriate and timely one. In this age of rapid university expansion in this part of the world, it is very essential for us to pause and take a fresh look into the whole realm of teaching and learning including the goals and objectives of university education.

We shall all need to check if we are moving in the right direction, as well as employing the most effective ways and means of achieving our objectives for the well-being of our students, the teachers, and the society at large. In this

technological age, it is very relevant for educationists to consider what we can learn from educational technology — not only in terms of employing educational media, but also in the broader sense of adopting the systems approach in solving our educational problems. Also there is a greater awareness of the need to improve university teaching, especially when the rapid increase in student population has brought about a wide range of student characteristics, learning styles and abilities.

With my long association within the field of education, first as a teacher, as a Head of Schools, and Director-General of Education in the Malaysian Ministry of Education, and presently as a Vice-Chancellor, this question of improving teaching among teachers and educators and maintaining the high academic performance of our learners and students has always occupied a top priority position in my mind. To ensure satisfaction and achieve success all of us should try hard to improve the teaching-learning process all the time throughout our professional career wherever we may be.

I believe that there are many difficult concepts and theories, which can be taught quite easily to our students, if we have the right instructional approach and media. But let us be reminded that this question of right approach is not as straightforward and simple as it appears to be. The right approach for imparting one particular topic in a particular field of study, may not necessarily be the most suitable or most effective method, for teaching a different topic within the same discipline. To complicate the issue, what is the right approach for one group of students may not be the best method for another group of students. What this illustrates, is that teaching requires skills of a wide range of instructional techniques for imparting a particular type of knowledge to a particular group of students at a particular time. Thus we see, that to be an effective teacher certainly requires more skills and abilities than simply being able to stand in front of the class and talk or read out lecture notes. It means having the ability to communicate effectively.

The problems of the teaching-learning process are numerous and therefore, as far as possible, teaching staff requires assistance to enable them to do an effective job of teaching. This would mean providing them with the necessary training to help them acquire the skills of effective communication, as well as providing the necessary infrastructure such as adequate teaching resources and facilities. Of course we always have to work within certain constraints of our University's resources.

Although the idea of formalising the various activities and facilities such as a Teaching-Learning Unit and an Educational Technology Unit geared to the improving of the teaching-learning process, has been in existence for many years in some universities of some more developing countries, it is still relatively new to Malaysia and other Southeast Asian universities. Hence it was felt that through a Conference of this nature, involving both developed and developing nations, much useful knowledge can be gained by the countries involved, particularly those from the ASEAN region. This is why, although the Conference is geared to ASEAN countries, the Organizing Committee has not confined the speakers to only members of the ASEAN countries, but has also invited speakers from the developed parts of the world such as the United States of America, England, Australia and Japan. We can learn from the success and failures of others, who have gone on before us. In fact, this is more

economical in terms of time and money than to learn by trial and error on our part.

May I also mention that the hard work of the Conference Organizing Committee is to be commended for much time and energy have been put into organizing it to make this Conference a success. To the Chairman and everyone of the members of the Committee, I offer my grateful thanks. It is also obvious that this Conference is made possible by the support and cooperation of several organizations. Their contributions whether great or small have contributed to the success of the Conference and their valuable efforts are very much appreciated.

In conclusion, I would like to say that I am very hopeful that through the deliberations and sharing of ideas by all participants during the Conference, many useful concrete findings and recommendations will emerge for the benefit of the Universities represented, and for the institutions of higher learning in the ASEAN Region as a whole. May I wish all of you a very pleasant and profitable stay here in Penang.

Saya sangat sukacita bahawa dalam persidangan antarabangsa yang meriah pada hari ini, Yang Berhormat Menteri Pelajaran, Dato' Musa Hitam, akan dapat merasmikan pembukaan persidangan Proses Pengajaran dan Pembelajaran dalam Universiti-universiti dan institiut pengajian tinggi. Saya percaya beliau adalah sangat layak dan sesuai untuk mengendalikan tugas itu. Oleh itu, saya dengan sukacitanya menjemput beliau menyampaikan ucapan Pembukaan resmi kepada kita sekalian.

Opening Address by Y.B. Dato' Musa Hitam, Minister of Education, Malaysia

Saudara Pengerusi Majlis

Yang Amat Arif Tun Suffian dan Toh Puan Bunny

Saudara Naib-Canselor dan Anggota-Anggota Universiti Sains Malaysia Pulau Pinang

Dair-Dair Yang Kehormat

Saudara-Saudara dan Saudari-Saudari Para Hadirin Sekalian.

May I first of all, as Minister of Education, and on behalf of the Malaysian Government, bid you all welcome to Malaysia, as well as to what has been repeatedly claimed to be this Pearl of the Orient, much perhaps challenged by other participants from other different parts of the world. I am highly impressed by the presence of so many of you from the different parts of the world to participate in this Conference, which in Malaysia is considered to be of immense importance, in view of the fact that we ourselves, are in the process of a search for the right type of education at university level, to serve the overall economic and social development interests of our country. You have come to Malaysia, for those of you from outside, at a period when our Country is embarking itself on a very ambitious programme, and for those of you coming from the Asean region, we could collectively be proud of the fact that the Asean region is now accepted to be one of the fast growing regions in the world, especially in terms of economic development. Thus, one would appreciate that the developmental efforts of our respective governments would not have succeeded, if not for the emphasis that is being given to education at institutions of higher learning. University education in our part of the world holds the key to the success or failure of our overall developmental efforts. University education, particularly in Malaysia, has become popular rather than elitist. University education, however, in order to make it effective, in order to make it worthwhile, is expensive, and needs to be expensive, so that the quality of graduates would be able to fit themselves in society to fulfill their responsibilities as required by society. In Malaysia, there has been a tremendous pace of development of university education, and since 1969, four new universities have been added to our solitary university in Kuala Lumpur called the University of Malaya. Now, the additional four universities, making it five, coincidentally, took place when we launched the Second Malaysia Plan, and what is popularly now known as the New Economic Policy. This means that the Government depends a great deal on the output from these universities to serve and fulfill the objectives of our new economic policy. But, more significant is the fact that, whereas university education covered only a very limited set of our community for those living in the urban areas especially, it now covers all sectors of our community, and in this respect, we can proudly claim that university education in our Country has indeed been democratised to such an extent that it is within the reach of any member of our society, the poor, the rich, the urban areas, as well as the rural

areas, not to mention those coming from the complex ethnic backgrounds, within our Country. It has become so popular, and so much in demand, that yesterday in Parliament, I was rather unhappy to announce that out of 15,098 students, who could easily enter universities under normal circumstances, 9,818 of them had to be rejected. This means, of course, that the whole attitude of the people, and the young of our Country would have to change, and would have to be adapted, and educators themselves will have to reorientate their thinking, not excluding the leadership of the Country. To make people in our Country realize that the time might soon have to come, and indeed, it has to come that education at the university level would have to be looked at, purely, from the point of view of getting education per se, and not in order to get better jobs with better salaries, and serving as a passport for entry into the upper echelons of our society.

In view of the popular nature of university education in Malaysia as well as, I believe, the existing situation in most other developing countries, various questions come to mind when one looks at this very subject of teaching-learning process in universities. Are we producing the right type of graduates to serve our society? Are we teaching our undergraduates, or are we educating them? How much are we stimulating them towards a search for knowledge on their own? How much have we been able to stimulate their thirst for knowledge, so that they themselves can make new discoveries, new inventions in the respective fields that they embark upon? What about research at post-graduate level, what about at post-doctoral level, what about in the various fields that need to be done, relevant to the needs of our society? What teaching-learning methods would suit us best, in view of what I call the democratization of university education in the sense that it reaches young men and women of varied backgrounds, poor and rich, as I said, rural and urban, different ethnic-cultural perceptions? How are we to approach the teaching-learning process in order to produce the best type of graduates from our institutions of higher learning? I am very happy to note that in Malaysia, we are not left out, and that, indeed, we are playing our role to search and try our best to ensure that university education would indeed suit and fulfill the needs of our dynamic society. I am happy to note that there is an increasing amount of awareness among the academic staff of the different universities in the Country as witnessed by the holding of this Conference itself.

I am deeply appreciative of what has already been done at this very University, the Universiti Sains Malaysia in Penang, towards achieving some form of success and determination on how to go about finding our ways to achieve success in this process of teaching and learning in the universities. The Senate Committee on teaching-learning process set up by the University itself I am sure, would be of great help, not only to the academic staff of this University, and the students, but also to people in the long run serving the overall interest of the university teaching profession in our Country. The assistance offered to the academic staff of this University, through this Committee on teaching-learning process, the information, the consultancy and advisory services provided by this Committee, the encouragement to adapt different methods of teaching as a form of learning process itself, the assistance and acquiring techniques of curriculum design and development and the research into teaching-learning methods — these are useful functions

that this Committee is serving for the teaching staff of this University. I hope and believe that what is now called the Committee, could be developed to a Unit that could then not only serve the academic staff and students of this particular University, but I hope that it will be able to serve the academic community of the whole Nation, and perhaps, if nobody else catches on the idea from different parts of the world in Asean, we may be able to see Universiti Sains Malaysia offering its services to the whole Asean region itself.

Ladies and Gentlemen,

Research is an important factor that would serve the very interest of the teaching and learning processes in universities as a back-up service. Research is a field, which is still, if I may use the word 'backward', especially in developing countries, and as Minister of Education in Malaysia, I must confess that, however much we considered ourselves as to have achieved in this field, we are still a very long way towards achieving a satisfactory goal to serve the interests of our community at large. In this field, you might note that research facilities are so lacking in developing countries that one often finds it necessary to go to other developed countries in order to proceed with research work, either to achieve higher degrees, or to do even post-doctoral research, on fields that would by logic, and by reason should, and could be found within the developing countries themselves. Not too long ago, and even until now, if one wanted to do a post-doctoral research in Malay studies, for example, or even in Islamic studies, not to mention other sciences, Malaysians still find it necessary to go to London, to go to the United Kingdom. This is, of course, a compliment to the United Kingdom, and to the developed countries, but nevertheless, it emphasises and telescopes the sort of problems that we face in our Country in further education, post-university, post-doctoral level within our respective countries in the developing world. If I may divert a little bit on a better aspect of international community activity for example, relevant in a way to the problem of doing research we saw in Manila up to just a week ago, a Conference, very much talked about, very much discussed, very big, taking a very long time, called 'Unctad 5'. One of the most significant aspects of this Conference was the way by which developing countries approached their problems and tried to tackle problems of international spectrum together with the developed countries of the world. And one of the glaring shortcomings was the lack of back-up statistics, factual understanding to put up whatever case the developing countries had for or against whatever issues they had to place before the international community. In other words, there was no research back-up, there was no research back-up that was provided for the developing world, that is known as the Group of 77. There was no attempt even to achieve a deeper understanding of the problems faced by the international economic community. This was in contrast to the very well-prepared and researched presentation of the Group B countries in this Conference to the extent that representatives of developing countries collectively could be considered as to have been floored by arguments and statistics provided by the Group B countries.

I am bringing up this what I call diversions, simply because I feel whether we like it or not, governments in developing countries would have to depend on the academic community to assist them in an in-depth study of different

problems faced by the world, be they of whatever nature that we are confronted with, problems that are becoming more and more complex and problems that need a great deal of specialisation. It is in this respect that I feel that developing countries when embarking on an exercise of the teaching-learning process at universities would have to consider and take into account. It is in this respect that the teaching-learning process at university level would have to adapt themselves or adapt itself to, so as to ensure that the developing world would be acquiring enough knowledge to serve themselves, but more importantly to ensure that the international community as a whole would be able collectively to act in order that we can all live in a better world. In this aspect, I am also happy to say that Malaysia itself is gearing ourselves to ensure that enough research would be carried out in the various fields within our universities. The University of Malaya in Kuala Lumpur has established an Institute of Advanced Studies, indeed it is opening itself up in two days' time, on the 15th of this month. Initially, for the year 1979, the University will spend 1.2 million dollars earmarked as operating cost, and that the plan is that this Institute would have a building of its own and facilities for research, so that it could serve as objectives of the Institute to complement and strengthen graduate studies and advanced research which are currently undertaken by the faculties and centres of the University by providing multi-disciplinary facilities for graduate studies and advanced research, to serve as a centre for project on orientated research relating to national development, to establish close relations and to collaborate with other universities, research institutions and similar organizations within and outside Malaysia with the purpose of encouraging and promoting graduate studies, advanced research and to offer graduate studies and research problems leading to higher degrees, and to train post-graduate and research personnel to meet the needs of the University and of the Country in general.

Ladies and gentlemen,

I do hope that my little speech, little from the point of view of a politician who tends to go on blabbering for hours, that from my little speech, you would have sufficient material enough as to be provoked into deeper thoughts, to be stimulated I hope, into more constructive thinking, of what the problem is all about, and how the problem could be overcome collectively for our mutual interest. Let me take the opportunity to thank Universiti Sains Malaysia for its kindness in inviting me this morning to meet with you. Let me congratulate the organizers for as I have been told by the good Vice-Chancellor, the fact, according to him, that it has not cost the University a single cent on organizing this Conference. Indeed, I think Universiti Sains Malaysia must have been learning very hard. I do not know who has been teaching them about this aspect. Let me wish you all the very best and a pleasant stay and a successful Conference. As a final advice, let me ask you not to take the publicity remarks about Penang by our two colleagues too seriously as to affect your Conference. And with those words, let me proudly, officially declare open this International Conference on Teaching-Learning Process in Universities at Universiti Sains Malaysia. Thank you.

CLOSING SESSION

Address by The Chairman of the Organizing Committee, Associate Professor Dr. Amir Awang

Y.B. Tan Sri Dato' Ishak Haji Pateh Akhir, Chairman of the U.S.M. Council,

Y.B. Tan Sri Datuk Haji Hamdan Sheikh Tahir, Vice-Chancellor of U.S.M.,

Professor Suetake,

Tuan-tuan dan Puan-puan yang dihormati sekalian.

Terlebih dahulu bagi pihak Jawatankuasa Penganjur Persidangan ini, saya mengucapkan setinggi-tinggi terima kasih kepada Y.B. Tan Sri Dato' Ishak dan juga Y.B. Tan Sri Naib-Canselor di atas kesudian Tan Sri hadir pada petang ini. Kepada Tan Sri Dato' Ishak kami mengucapkan berbanyak terima kasih kerana sudi juga merasmikan penutupan Persidangan pada petang ini.

Ladies and Gentlemen,

Just now Miss Danaraj from U.S.M. has kindly congratulated the Organizing Committee for the good work well done. We feel honoured by the remark. However, we do realise that whatever success we have achieved, a great deal of it is the result of your cooperation, support and perseverance. The fact that you stick with us till this very minute clearly indicates that your interest is still 99.9%. For all your support, and the support and cooperation of those who have left the Conference earlier for various reasons, I would like to give you a big hand.

I realise that I have missed a great deal of happenings in this Conference. Fortunately Mr. Boey and Dr. Chan have kept me informed of the progress of the Conference. I am pleased to note that all of you feel very much at home here in U.S.M., and we are happy that we are able to make your short stay with us a happy and memorable one.

Besides your significant contributions to the success of this Conference, one cannot deny the hard work put in by my colleagues, both on the main organizing committee as well as on the sub-committees. They have worked so very hard to ensure that all of you will be able to experience the Malaysian, and in particular, the U.S.M. hospitality. To them, I would like also to give a big hand.

I am happy to note that apart from achieving whatever we have set ourselves to achieve vis-a-vis the Conference, we have also, through the Conference, succeeded in providing the avenue for renewing existing ties among us as well as establishing new relationships, which to my mind, are equally important in this world of sharing. To ensure everlasting memory of the friendship, we have compiled the names and addresses of the participants of this

Conference, and we hope this simple gesture on our part, will help in fostering the good relationships.

The success of this Conference is to a large measure due to the generous contributions that we have received from our donors. If they are here with us today, I am sure they would be delighted to see that their contributions have been put to the best use. We hope the success that we have achieved today will further stimulate them to channel their funds to U.S.M. when such funds become necessary. To all of them, I like to say thank you.

We have together come up with several proposals and recommendations. In themselves, they would be useless. It is up to us to follow up on our own proposals and recommendations, and I personally look forward to attending Conferences on these proposals and recommendations. I would hope that some of us will take the initiative to organize Seminars or Conferences on the proposals, so that we may meet again, share our experiences again, and contribute again to the success of the Conference on Teaching-Learning Process at Institutions of Higher Learning. The Pearl of the Orient which I mentioned at the beginning of the Conference might have been shipped to another place — may be Philippines, may be Thailand, may be Indonesia, may be Singapore. Let's try to trace its whereabouts and use it as a basis to identify the next venue for our Conference.

Last for not least, I like to share with you two main regrets, if at all they can be called regrets. Over the last five days I have not been able to meet all of you in the manner that I wish to meet you. I feel I have failed to know you more intimately. Perhaps when you organize the next Conference we will get closer. The other regret is that due to unavoidable circumstances and exigencies of services, I have not been able to personally attend all the sessions. I know I missed a lot of the interesting moments, but I hope I will be able to compensate what I have lost through reading the reports by the rapporteurs as well as the recommendations compiled by the Chief Rapporteur. Finally in conclusion, I like to take this last opportunity to say thank you to every one. It is very difficult for me to enumerate one by one here in this brief ceremony, but let me convey to all those responsible for the success of this Conference our heartfelt gratitude and thanks for all the cooperation they have given us, and with that I wish you good luck and a safe journey home. Thank you very much.

Address by the Vice-Chancellor of Universiti Sains Malaysia, Y.B. Tan Sri Datuk Haji Hamdan Sheikh Tahir

Yang Berbahagia Tan Sri Dato Ishak Bin Haji Pateh Akhir
Pengerusi, Majlis Universiti Sains Malaysia.

Dr. Amir Awang, Pengerusi Jawatankuasa Pengelola,

Yang Mulia Tetamu-Tetamu Kehormat,

Profesor-Profesor, Pensyarah-Pensyarah, Tuan-Tuan dan Puan-Puan sekalian.

Terlebih dahulu saya bagi pihak semua peserta dan Jawatankuasa Pengelola sekalian ingin mengucapkan ribuan terimakasih kepada Y.B. Tan Sri Dato Ishak Bin Haji Pateh Akhir kerana telah sudi hadir bersama-sama kita pada hari ini untuk merasmikan Upacara penutup Persidangan Antarabangsa mengenai Proses Pengajaran dan Pembelajaran di Universiti-Universiti yang telah berjalan selama lima hari di Universiti Sains Malaysia ini.

Ladies and Gentlemen,

I am very pleased to be with you all once again at this closing ceremony which marks the culmination of a strenous five days of intensive activities. At this juncture, I must apologise for the fact that I have not been able to attend any of the sessions because of a variety of important commitments that I have to attend to at present. Although I have not attended the Conference in full, but from my informal discussion with participants from different countries, I can see that you have been working very hard the last few days, and I believe that you have come up with some useful recommendations towards a better approach, understanding and improvement in the processes of teaching and learning in Institutions of Higher Learning.

I do personally believe that these processes are undoubtedly important as they will ensure a progressive starting point in the development of any society and country, thus a university which is a centre for tertiary education must venture and improve both processes. I am sure and I am confident that any suggestion that is well-considered and discussed on approaches, techniques and recommendations would be of immense value and importance to ASEAN universities towards improving the process of teaching-learning to meet the rapid increase in student population, which has brought together a wide range of student characteristics, learning styles and abilities.

As I have said before, in Conferences such as this, not only are we able to meet each other and strengthen friendly ties amongst centres of higher learning, but it has enabled us to exchange ideas, and at the same time be

able to acquire beneficial ones which can help improve further the teaching-learning processes. Above all with the presence of participants from developed countries, much useful knowledge has been gained by participating members, in particular those from universities in the ASEAN region. This kind of genuine effort should be extended to other disciplines especially those that will improve further both the society and the country. We are exposed to what others are doing to improve their respective communities, and at the same time, it has given us the opportunity of showing others what we have done in contributing towards this goal in our society. It is through this type of exchange that we learn from the achievements of others, and simultaneously get the opportunity to offer our services to them.

Although Conference discussion has ended, I hope that this is just the beginning of a whole process of thinking along this line in the years ahead. A Conference is of value to anyone of us only, if what is learnt is brought home to our respective universities to be tried out and to be shared by many others among our colleagues.

I hope that this is not the first and the last conference of this nature to be organized in this part of the world. It is hoped that other universities in different ASEAN countries may volunteer to host such meetings that will enable many of us to get together.

Last but not least, to all our participants, we would like to express our appreciation for having contributed so much towards the great success of this Conference. We hope that you would overlook any shortcomings, and any inconveniences that you might have experienced during your stay in Penang and in our University campus. We also hope that during the past few days, you have enjoyed being at this University, and we look forward to seeing you again in the future.

Finally on behalf of the organizers, I would like to express our deepest gratitude to all organizations and persons for having provided financial and other forms of support, encouragement and cooperation, and all those who have directly or indirectly contributed to the success of this Conference. On behalf of my staff, and all others who have been associatd with the holding of this meeting, I wish you all a pleasant journey home.

Address by The Chairman of Council, Universiti Sains Malaysia, Y.B. Tan Sri Dato' Ishak Hj. Pateh Akhir

Mr. Vice-Chancellor, Chairman and Members
of the Organizing Committee,
Distinguished participants, Ladies and Gentlemen,

Allow me, first of all, to thank the Vice-Chancellor, the Chairman and members of the Organizing Committee for giving me the opportunity to be here this evening, and also for according me the honour to officially declare the Conference close. Thanks to their invitation, I have managed to experience intellectual excitement during the last hour.

Ladies and gentlemen,

I am aware that you have for the past few days been working very hard, both in the Plenary and Workshop sessions, and it is perhaps fair to assume that you are now feeling a little tired. I shall, therefore, be very brief. First, let me congratulate you for a job well done. The Conference, I am told, has been on the whole interesting and useful. The brain-storming sessions have produced concrete ideas, and useful recommendations have emerged from them. Indeed, coming as you do from different countries with diverse historical, social and cultural backgrounds, the fact that you could come to a common agreement at all about the complex problems of teaching and learning in universities is more than what I would ordinarily expect. My only hope is that the recommendations should not just remain as recommendations. It should not be forgotten as soon as you leave Penang, but attempts should be made to implement for the good of your institutions. Here, I am reminded also of what the Honourable Minister of Education said when he opened the Conference. You will recall that he suggested that this University, Universiti Sains Malaysia should take the lead in providing leadership in the area of teaching-learning process. I have no doubt that this University will take up the challenge, but I also hope that other institutions would play their part in this area, so that all of us would benefit from the efforts, particularly in the light of the rapid social, economic and political changes in our respective countries. In regard to your findings and recommendations, as an administrator, I pay more attention to the goals and objectives of university education. I am, indeed, encouraged by the definite awareness that universities must provide graduates, trained to meet social needs, and this broadly means that graduates from our universities must be adequately educated to fulfil manpower needs for social, economic and technological developments. In this connection and referring to the Conference findings and recommendations just been discussed, I am tempted to add another item under "Student Learning Problems," more specifically, under "Instructors and the Instructional System." That is to say, lack of understanding and of commitment to societal needs.

Second, Ladies and Gentlemen, let me as Chairman of the Universiti Sains Malaysia Council, thank you very much for your active participation

and cooperation. As you may be aware, this year we are celebrating our tenth anniversary. We have drawn up a series of programmes to mark the occasion, and this Conference is the first of the series. By your kind support and active participation, you have given it a good start for which the whole University is grateful. You have also given the Chairman and members of the Organizing Committee much satisfaction. I know that they have worked very hard to ensure the success of the Conference, and I am happy that their efforts have been amply rewarded. I join the Vice-Chancellor in thanking and congratulating them.

Before I conclude, I should also like to say thank you to Professor Suetake for having donated to Universiti Sains Malaysia a response analyser. The gift will not only stimulate more active efforts in teaching-learning process, but will also foster closer relationship between Universiti Sains Malaysia and other institutions in our common endeavour to maximise teaching and learning effectiveness. Without doubt, the Educational Technology Unit will make full use of the analyser.

Now, Ladies and Gentlemen, all good things must come to an end they say, and so must this Conference, but before declaring it close, let me say once again, how happy we have been to have had you with us for the last few days. It is with a heavy heart that I say good-bye, good-luck, good health and God bless you. I have now much pleasure in declaring this Conference officially close. Thank you.

CONFERENCE PROGRAMME

TUESDAY, 12 JUNE 1979 — GOALS AND OBJECTIVES OF UNIVERSITY EDUCATION

8.00 — 8.45 a.m. :	Registration (LTA)	
8.45 a.m. :	Guests to be seated	
9.00 — 9.30 a.m. :	**Opening Ceremony** (LTA)	
:	Address by Associate Professor Dr. Amir Awang, Chairman of the Organizing Committee.	
:	Address by Y.B. Tan Sri Datuk Haji Hamdan Sheikh Tahir, Vice Chancellor, Universiti Sains Malaysia.	
:	Address by Y.B. Dato' Musa Hitam, Minister Education, Malaysia.	
9.30 — 10.30 a.m. :	Keynote address by Y.A.A. Tun Dr. Mohamed Suffian bin Hashim, Lord President, Federal Court, Malaysia on 'Goals and Objectives of University Education' (LTA)	Chairman: Y.B. Tan Sri Datuk Haji Hamdan Sheikh Tahir
10.30 — 11.00 a.m. :	Tea Reception	
11.00 — 1.00 p.m. :	Trend Paper 1 by Dr. Abdul Latif, Chief of ACEID UNESCO on 'Goals and Objectives of University Education in Developing Countries' (LTA)	Chairman: Assoc. Prof. Musa Mohamad
:	Discussion (LTA)	
1.00 — 2.00 p.m. :	Lunch (Building 335)	
2.00 — 4.00 p.m. :	Tour of Educational Technology Unit and Library, Universiti Sains Malaysia.	
:	Viewing of videotape on Media Resource Centre, University of Hong Kong (LTA)	
7.30 p.m. :	Dinner given by Penang State Government (Ambassador Hotel)	

WEDNESDAY, 13 JUNE 1979 — CHARACTERISTICS OF UNIVERSITY STUDENTS AND THEIR LEARNING PROBLEMS

9.00 — 10.00 a.m. :	Trend Paper 2 by Y.B. Datuk Professor Awang Had Salleh, Director, Mara Institute of Technology on 'Characteristics of University Students and Their Learning Problems' (LTH)	Chairman: Dr. R.R. Lohia
10.00 — 10.30 a.m. :	Working Paper 1 — Dr. Willi Toisute, Vice Rector of Satya Wacana Christian University, Indonesia. (LTH)	
10.30 — 10.45 a.m. :	Coffee Break	
11.00 — 11.30 a.m. :	Working Paper 2 by Dr. Ong Jin Hui, Lecturer, Department of Sociology, University of Singapore, Singapore. (LTH)	Chairman: Prof. Somkid Kaewsonthi
11.40 — 12.10 p.m. :	Working Paper 3 by Dr. Natividad J. Munarriz, Chairman, Department of Counsellor Education, University of Philippines, Philippines. (LTH)	

12.20 — 12.50 p.m. :	Working Paper 4 by Dr. Paitoon Sinlarat, Assistant Professor, Department of Higher Education, Faculty of Education, Chulalongkorn University, Thailand. (LTH)	
1.00 — 2.00 p.m. :	Lunch (Building 335)	
2.00 — 4.00 p.m. :	Workshop A (Seminar Rooms)	
4.00 — 6.00 p.m. :	Tour of Penang.	

THURSDAY, 14 JUNE 1979 — INSTRUCTIONAL PROBLEMS AND METHODS OR STRATEGIES USED FOR OVERCOMING THEM

9.00 — 10.30 a.m. :	Discussion on findings of Workshop A (LTH)	Chairman: Prof. Wu Teh Yau
10.30 — 10.45 a.m. :	Coffee Break	
10.45 — 11.45 a.m. :	Trend Paper 3 by Professor L.R.B. Elton, Head, Institute of Educational Technology, University of Surrey, England on 'Instructional Problems and Methods or Strategies used for overcoming them.' (LTH)	Chairman: Dr. Natividad J. Munarriz
11.50 — 12.20 p.m. :	Working Paper 5 by Prof. Conrado R. Aquino, President of University of the East, Philippines. (LTH)	
12.30 — 1.00 p.m. :	Working Paper 6 by Professor Somkid Kaewsonthi, Dean, Faculty of Economics, Chulalongkorn University, Thailand. (LTH)	
1.00 — 2.00 p.m. :	Lunch (Building 335)	
2.00 — 2.30 p.m. :	Working Paper 7 by Professor M. Koganei, Director of Center for Educational Technology, Tokyo Gakugei University, Japan. (LTH)	Chairman: Prof. Marsetio Donoseputro
2.30 — 3.00 p.m. :	Working Paper 8 by Dr. S. Srinivasan, Physics Department, Indian Institute of Technology, India. (LTH)	
3.00 — 5.00 p.m. :	Workshop B (Seminar Rooms)	

FRIDAY, 15 JUNE 1979 — SUPPORTIVE INFRASTRUCTURE, ACADEMIC STAFF TRAINING AND THE USE OF EDUCATIONAL TECHNOLOGY FOR DEVELOPING EFFECTIVE TEACHING-LEARNING PROCESS

9.00 — 10.30 a.m. :	Discussion on findings of Workshop B (LTH)	Chairman: Prof. (Dr.) Abd. Hamid Hj. Abd. Rahman
10.30 — 10.45 a.m. :	Coffee Break	
10.45 — 11.45 a.m. :	Trend Paper 4 by Professor John Moldstad, Chairman, Department of Instructional Systems Technology, Indiana University, U.S.A. on 'Supportive Infrastructure, Academic Staff Training and the Use of Educational Technology for Developing Effective Teaching-Learning Process.' (LTH)	Chairman: Prof. Atan Long
11.45 — 12.15 p.m. :	Working Paper 9 by Associate Professor Boey Chee Khiew, Coordinator of Educational Technology Unit, Universiti Sains Malaysia &	

	Dr. Chan Geok Oon, Lecturer in Educational Technology Unit, Universiti Sains Malaysia, Malaysia. (LTH)	
12.15 — 2.00 p.m. :	Lunch (Building 335)	
2.30 — 3.00 p.m. :	Working Paper 10 by Mr. Anthony Roger Marsh, Lecturer in Biology Education, University of Hong Kong, Hong Kong. (LTH) *(Unable to present)*	Chairman: Dr. Willi Toisute
3.00 — 3.30 p.m. :	Working Paper 11 by Dr. Rex Meyer, Director of Centre of Advancement of Teaching, Macquarie University, Australia. (LTH)	
3.30 — 4.00 p.m. :	Working Paper 12 by Professor Kunihiro Suetake, Director of the Center for Research and Development of Educational Technology, Tokyo, Japan. (LTH)	
4.00 — 6.00 p.m. :	Workshop C (Seminar rooms).	

SATURDAY, 16 JUNE 1979 — FINDINGS AND RECOMMENDATIONS

9.00 — 10.30 a.m. :	Discussion on findings of Workshops C (LTH)	Chairman: Prof. Conrado P. Aquino
10.30 — 10.45 a.m. :	Coffee Break	
10.45 — 12.00 a.m. :	Visit to Malayan Teachers' Training College, Pulau Pinang and Regional Centre for Education in Science and Mathematics.	
12.00 — 1.00 p.m. :	Lunch (Building 335)	
1.00 — 4.00 p.m. :	Tour round Penang Island	
5.00 — 6.20 p.m. :	Final Planery Session — Findings and Recommendations (LTA)	Chairman: Assoc. Prof. Boey Chee Khiew
6.20 — 7.00 p.m. :	**Closing Ceremony** (LTA)	
6.25 p.m. :	Invited guests to be seated.	
:	Address by Associate Professor Dr. Amir Awang, Chairman of the Organizing Committee	
:	Address by Y.B. Tan Sri Datuk Hj. Hamdan Sheikh Tahir, Vice-Chancellor, Universiti Sains Malaysia	
:	Closing Address by Y.B. Tan Sri Dato' Ishak bin Haji Pateh Akhir, D.P.M.S., J.M.N., P.S.M.	
7.45 p.m. :	**CONFERENCE DINNER** (Vice Chancellor's Residence)	

SUMMARY OF DISCUSSIONS

SESSION ON
GOALS AND OBJECTIVES OF UNIVERSITY EDUCATION

Trend Paper:
New Goals and Objectives of University Education: Exploration of Some Trends in Asia

by
Dr. A. Latif
Unesco Regional Office for Education
in Asia and Oceania
Bangkok.

Discussions

A question was raised on the relationship between the noble approach and society with reference to the inequitability of chances of university education; methods of overcoming and compromising these problems. The paper did not discuss the intake of students from urban and rural areas in Asian universities. In reply the speaker said that Unesco's standpoint was the resultant viewpoints of member countries. Any test for university admission was but a reflection of the social conditions. With the wholesale modelling of foreign type of teaching and research, those urban-born would find it hard when tested on topics of a rural setting and vice-versa. He called for a university development promotion based on field-oriented activities.

There was a call for more extension work and improvement of the teaching-learning process under two necessary conditions; (1) presence of a Centre for Education Development and (2) training of university teachers. So far only exhortations and preaching on the importance of university education were made with little value or effect. The university authorities should provide a means for teachers as well as encourage them to learn the needful in order to put into practice what had been learnt. Lurching from experience to experience should not be encouraged. The training of university teachers should not be taken to mean extra-curricular activity by the universities. Greater efforts should be concentrated to have more teaching manpower trained in this direction by giving time-release and other inducements. The speaker remarked that universities had to undertake these activities for their own good. He cited the Curriculum Development Centre in Kuala Lumpur and the Educational Technology Unit in Universiti Sains Malaysia as commendable efforts in this direction. He also stressed that warnings of this kind should be heeded. Other than techniques in teaching which were now losing some of its glamour, the personality factor should be taken into account and the tools of evaluation be re-assessed.

A participant commented that developing countries were presently madly borrowing teaching and learning techniques, sometimes blindly. He stressed that there was a need to examine the fundamental basis of whose education we were talking about. Everybody concerned had different notions regarding university education. He felt that university education should be related to employment and when employment could not be found, the education system and the unemployed were usually blamed. He emphasised that the job of the Government of the day should be to develop both the rural and urban people.

Another participant commented that there were too many needs stipulated for the universities which might be choked to death by these needs. He would like to know what were the priorities as seen by Unesco and wondered where moral education could be fitted into the university curriculum. In response the speaker stated that listing of university education objectives had been done by Unesco but he was not sure about the issue on priorities. He thought that education and employment had no direct links. He urged that universities should develop their own roles. With regard to moral education, he felt that the definition of moral education should be made clear first. Were the preachers also the practitioners of the taught morality? By going into the rural areas to help the rural people a person could empathise with these rural people their problems. This might be one form of moral education, but there was no course in the university which was just concerned with morality alone. Unesco had sponsored three conferences in Japan on the moral dimension of education so far.

The difference in methodologies in teaching arts and science and the differences and similarities between applied and basic research were raised. A participant responded to this by commenting on the similar nature of the problem in teaching arts and science and highlighted the different points of view using the "half-full/half-empty" analogy. While people in the sciences tend to be too factual, less discussive and neglecting judgement but not understanding, the arts people tend to be too discussive and might forget the understanding part of the process. These were artefacts of our upbringing and we should remedy this by bringing the arts and science students closer together for mutual benefit. Another participant continued by citing the development of the copper mine in Papua-New Guinea which needed natural and social scientists, economists and anthropologists as a good example of bringing arts and science together. Basic research might not be applicable immediately but might turn out to be useful in future. A third participant continued that basic research was badly needed to get programmes going. In the context of teaching, both applied and basic research were required.

SESSION ON
CHARACTERISTICS OF UNIVERSITY STUDENTS AND THEIR LEARNING PROBLEMS

Trend Paper:
Characteristics of University Students in Malaysia and Their Learning Problems

by
Professor Dato' Awang Had Salleh
Mara Institute of Technology, Malaysia.

Working Papers:

1. Characteristics of University Students and Their Learning Problems: An Indonesian Case
   by
   Dr. Willi Toisute
   Satya Wacana University
   Salatiga, Indonesia.
2. Characteristics of University Students and Their Learning Problems: The Singapore Case
   by
   Dr. Ong Jin Hui
   University of Singapore,
   Singaore.
3. Characteristics of University Students and Their Learning Problems
   by
   Dr. Natividad J. Munarriz
   University of Philippines,
   Philippines.
4. Characteristics of University Students and Their Learning Problems
   by
   Dr. Paitoon Sinlarat
   Chulalongkorn University,
   Thailand.

Discussions

The issue of examination results being used to measure students' achievements was raised. The speaker's view was that he prefered to measure students' learning not from the viewpoint of their achievements but more from the profile of students' deficiencies.

A participant expressed her disagreement on some of the student learning problems identified in the trend paper, e.g. "Highly dependent on lecture notes," "Highly dependent on prescribed texts" and "Highly dependent on cooperative study group" as dependency problems. These might be seen more

as motivation to generate learning rather than problems. The speaker explained that consulting prescribed texts was a matter of course, but it could become a problem if students limited their reading only to these texts. The problem with "cooperative study group" was that students then tend to be satisfied as long as their achievement conforms to that of the group to which they belong. Consequently this could be a hinderance to students with regard to achieving excellence. On the question of "Inability to memorise formulae" as a problem of study inadequacy, the speaker contended that this was true especially where "open-book" examinations were not practised. He further added that learning is a process which involves searching for information rather than merely a term to describe an ability to answer examination questions. Still on the issue of examination, question spotting was discussed. The speaker indicated that from his experience, students did not attempt to answer questions which were also set in previous examinations. However past examination questions did help students in their speculation of what questions were likely to appear in the coming examinations.

Student motivation was discussed at length. It was seen as one of the most important problems in the teaching-learning process and therefore efforts should be made to improve this. One of the speakers presented figures which indicated that the biggest single reason given by students for going to universities was to get a degree and hence a good job. Such a motive, while considered as low from the academic viewpoint, is nevertheless a most pragmatic one for the students. Studying for study sake while desirable might not be useful unless students get their degrees in the end. A major problem students faced, based on the research experience of one participant, was the ambivalence of teachers. They asked students to study because the subject was interesting but when it came to examinations, students were tested mainly on memory work in one form or another. A basic question which needed to be answered was whether university courses should be designed to cater directly to students' interest or that students should fit into the courses available. Perhaps the format of the courses, in terms of teaching and examinations, should be modified to represent more of what we wished to see. Since the good students will do well in their studies anyhow, the emphasis, under the existing system of education, should be geared towards improving our teaching for the benefit of the weaker students. In this respect, the student problems were very similar, be it in the developed or developing countries.

The problem of motivating students was an interesting one but one speaker felt that in classes with numerous groups of students from diverse backgrounds, it would be extremely difficult to find ways which would motivate all groups. Often motivation efforts worked with one small group but had no effect whatsoever on the rest of the class. A participant cautioned that we should distinguish the two kinds of motivation: (1) The motivation for entering university and (2) the motivation for learning a particular subject. for many students (1) was not always reflected in (2). The question was whether there was any correlation between (1) and (2).

Another point discussed was that the loss of confidence and unrealistic perceptions of goals by students might be deeply rooted in the child-parent and other family relationships. Could this imply that university teachers were largely impotent in those areas? The speaker from the Philippines mentioned

that students in her country, to a significant extent, were subjected to parental pressures or that from other immediate family groups in their selection of universities and academic programmes. Often parents who were doctors pressured their children to become doctors even though they were not suitable material nor had the interest.

The statement in one of the papers that "The thought of remedial work in mathematics is not well accepted in the tertiary level, most mathematics professors maintaining that the basics must be well learned earlier, in the secondary level" was brought up for further discussion. One participant felt that this statement was rather outdated because there had been in recent years numerous efforts and publications on remedial mathematics. There were many instances where non-mathematics teachers, by their ill-founded advice and attitudes, had helped to create a "mental block" in students towards mathematics. In short, these people were doing a disservice to the mathematics teachers. The current problems lay mainly in the teaching of service mathematics courses for non-mathematics majors. One suggestion from a speaker was to try motivating the mathematics students by making courses more lively via a combination of teaching methods. In his experience mathematics presented less problems since students had been exposed to the subject while in school. Another speaker suggested that the subject matter as well as teaching methods should be made more meaningful to the students. Her own as well as her mathematics colleagues' experience indicated that many students entering universities were not ready for university level mathematics. Her University had attempted to overcome this problem via remedial courses which were given no weightage in the undergraduate curriculum.

The problems faced by students in language courses were discussed next. The Universiti Sains Malaysia case was cited. Students, although highly motivated and participating fully in study group discussions had, nevertheless shown a lack of comprehension ability in English resulting in graduates who lacked indepth study and scope in their major subjects. To what extent an inadequacy in English had hampered students' studies in other Asean countries? One speaker referred to the Singapore Joint Campus study which showed that students tend to group according to their linguistic background and ability which in turn resulted in them keeping an academic and social distance from other groups. He felt that it was better to leave these self-supporting groups as they were because in the past, well intended attempts to integrate them had given rise to problems, e.g. Chinese medium students felt lost when placed in English medium groups. Hence it would be better to attempt helping the whole group to improve their command of English. In the case of Thai students, the lack of opportunity for practice made the learning of English rather difficult.

The Chairperson closed the discussion by stating that the differences in environment, social and cultural factors as well as the educational needs and structure in each country and each institution affect student characteristics and learning problems. Awareness of these factors was crucial to being an effective teacher.

SESSION ON
INSTRUCTIONAL PROBLEMS AND METHODS OR STRATEGIES USED FOR OVERCOMING THEM

Trend Paper:
Instructional Problems and Methods or Strategies Used for Overcoming Them

by
Professor Lewis Elton
University of Surrey,
United Kingdom.

Working Papers:

1. Instructional Problems and Methods or Strategies used for Overcoming Them: The Philippine Experience
   by
   Professor Conrado P. Aquino
   University of the East Manila,
   Philippines.
2. Instructional Problems and Methods or Strategies used for Overcoming Them: A Case Study in the Teaching of Micro Economics
   by
   Professor Somkid Kaewsonthi
   Chulalongkorn University,
   Thailand.
3. Instructional Problems and Methods or Strategies used for Overcoming Them: Development of a Teaching Skills Training System
   by
   Professor Masami Koganei
   Tokyo Gakugei University,
   Japan.
4. Instructional Problems and Methods or Strategies used for Overcoming Them
   by
   S. Srinivasan
   Indian Institute of Technology,
   India.

Discussions

The Keller Plan method advocated as an example of individualised learning in answer to how could we make students more independent in their learning attracted further discussion and there were requests for more detailed information. Different subjects might require different teaching methods and the Keller Plan might not be suitable to all subjects or even all topics within a

subject. The teachers' role in the Keller Plan method was being extended — he would be conducting facilitated learning, not just transfering of knowledge from the past to the future. A participant was doubtful whether the Keller Plan could be used when there was a lack of staff in many universities in the Asean Region. It was undeniable that the teachers had to be given more time to prepare Keller Plan courses. Physical facilities too had to change. A number of small rooms would have to take the place of a lecture room. Examination methods would be somewhat different.

One participant stated that she had a personal view on teaching. Instructional problems were subject-specific and not general. The learning process would include the lecture, group discussion, self-learning and independent work. Teaching for understanding would include case studies relevant to society, group work, self-learning and independent work.

Case study method of training in medical education was cited as a very effective way of learning and it should be extended to other fields. This brought up the question of using "case" examples from abroad in our teaching. One speaker responded that she would not neglect foreign examples. To apply the advancements of foreign science to local conditions was more important than to just read the foreign science for its own sake.

Refering to Working Paper (3) the question asked was whether tutorials should be made compulsory. The answer was that tutorials were not compulsory but the students always turned up. Still on the same paper, there was concern expressed as to the desirability of having a handbook for the teachers because they should be allowed some flexibility as to how the course would be taught. The speaker replied that the handbook was for the purpose of coordinating the course since several lecturers were teaching it.

How the problem of making the theory and its experimental verification contemporaneous in science teaching was overcome generated some keen interest, especially when the presentation incorporated a demonstration of a 'do-it-yourself' kit for electronics learning in a Physics course. The solution lay in giving lectures supplemented by showing of slides and demonstration of experiments. A participant questioned if this was the only way of integrating theory and experiments in science courses. It was pointed out that students would have difficulty in making notes while slides were being shown. The 'walk-in' laboratory and the individualised learning method were suggested as better alternatives.

Three open-ended questions were posed and they should provoke infinite discussions:

1. Are instructional problems largely human problems?
2. Are there general solutions or just specific answers to instructional problems?
3. Should one seek to innovate in his teaching without guarantee of success and with difficulties in measuring success?

SESSION ON
SUPPORTIVE INFRASTRUCTURE, ACADEMIC STAFF TRAINING AND THE USE OF EDUCATIONAL TECHNOLOGY FOR DEVELOPING EFFECTIVE TEACHING-LEARNING PROCESS

Trend Paper:
The Role of Instructional Technology in Higher Education Institutions in the United States

by
Professor John Moldstad
Indiana University,
U.S.A.

Working Papers:

1. Supportive Infrastructure, Professional Training and the Use of Educational Technology for Developing Effective Teaching-Learning Process in Malaysian Universities
   by
   Associate Professor Boey Chee Khiew
   and Dr. Chan Geok Oon
   Universiti Sains Malaysia,
   Malaysia.
2. Supportive Infrastructure, Academic Staff Training and The use of Educational Technology For Developing Effective Teaching-Learning Process
   by
   Dr. G. Rex Meyer
   Macquarie University,
   Australia.
3. Educational Technology for the Help of Conducting Better Instruction
   by
   Professor Kunihiro Suetake
   Tokyo Institute of Technology,
   Japan.

Discussions

The trend paper presented very strong justifications for the need for instruction to change from traditional "chalk and talk" method to the use of audiovisual technology. Hence, discussions which followed centred around this theme. Several participants voiced their concern over the excessive use of modern technology in the teaching-learning process. Firstly there was need to balance technological development and the respect for nature and secondly, the rate of technological change ought to be checked so as to avoid undesired

social and cultural consequences. The next concern was the cost of using the audiovisual technological method of instruction. Would Asean countries at this stage of their development be able to afford such systems of instruction and if they could, it must be at the expense of something else. Another was of the opinion that it would be far more viable at this stage of their development for Asean countries to channel their efforts to improving the existing methods of instruction rather than to adopt costly new ones.

The next point of discussion was reward for good teaching arising out of working paper (1). Concern was expressed that university administration had still yet to show tangible means of rewarding good teaching although increasing concern had been shown by them on increasing teaching effectiveness. How could administrators bridge the credibility gap between rewarding good teaching and good research? Suggestions put forward were:—

1. Promote lecturers on the strength of their good teaching just like what was being done now for good research.
2. Give lecturers sufficient time off for preparation and production of teaching-learning materials, research in teaching-learning methods and involvement in activities connected in the teaching-learning improvement.
3. Recognise publications on teaching-learning matters as on par with other research publications.

Another participant felt that this conference was just as relevant and important for university administrators as for lecturers but why were the former not present in a larger number.

Participants agreed that the right supportive infrastructure was necessary in order to encourage and promote good teaching. Moral support from all sectors of the university, adequate financial support, teaching-learning facilities and media services were deemed essential pre-requisites for promoting teaching-learning improvement efforts.

Professional training for academic staff was also discussed and there was agreement that some form of training programme was useful but the exact nature of such a programme did not emerge from the discussion. In general it was felt that workshops, seminars and short courses on different aspects of university teaching and learning would be very beneficial to the academic staff.

The demonstration of a relatively simple teaching feedback device called the Response Analyzer involving all the participants created great interest towards the end of this session. Many questions were asked but they were, in the main, concerned with the technicality of the machine demonstrated.

FINDINGS AND RECOMMENDATIONS

A draft of the findings and recommendations summarised from the Workshop discussions was presented for further discussions at the final Plenary Session. The following is the finalised summary:

I. Goals and Objectives of University Education

1. Universities must produce graduates who are trained to meet societal needs. This means that our university graduates must be adequately educated to fulfil the relevant manpower needs for social, economic and technological development. Thus apart from being institutions for instruction and research, universities should also be agents of change and have certain roles for community services.
2. Universities must be places where students can develop certain qualities deemed necessary to become balanced and motivated individuals. These students must be creative and innovative on the one hand while sufficiently skilful in coping with rapid technological changes on the other.
3. Universities are to preserve, transmit and renew the cultural heritage of the people. In doing so, it is assumed that university graduates will be responsible citizens who hold societally accepted values and attitudes.
4. Universities must also be places where knowledge is pursued through research and scholarship and where scholars are properly groomed to meet the manpower needs of institutions of higher learning.

II. Student Characteristics: Similarities and Differences Among the ASEAN Countries

Similarities

1. Students entering universities in the region reflect a tremendous diversity of backgrounds related to demographic, social, cultural, ethnic and economic factors.
2. Most of the countries take in students who came from disadvantaged situations.
3. The majority of students are socio-economically motivated to enter universities. They do not seem to be intellectually motivated initially. Indeed it appears many students graduate from universities without having truly experienced intellectual excitement.
4. A large proportion of students experience excessive pressures from parents and others to score high grades and obtain their degree scrolls in the minimum time possible.

Differences

1. Student language proficiency with respect to the medium of instruction varies through the region.

2. Schooling background of students before entering universities also differ.
3. Student maturity varies considerably from country to country.

III. Student Learning Problems

Associated with the learning situation

1. Adjustment to unfamiliar learning processes.
2. Adjustment to the social environment of university life.
3. Constraints posed by the central government education policy.
4. Their own pre-university education may not be totally related to university education.

Associated with the student

1. Insufficient command of the language used in instruction.
2. Personal emotional problems.
3. Financial problems.
4. Parental and peer group pressures to perform well.
5. Mismatch to chosen study programmes and courses.
6. Lack of motivation.

Associated with the instructor and instructional system

1. Lack of motivation to improve teaching. No tangible reward for good teaching.
2. Lecturers lack professional training in teaching techniques.
3. Lack of understanding of and sympathy for students' learning difficulties.
4. Inadequate staffing — poor staff/student ratio resulting in inadequate attention paid to teaching.
5. Poor teaching methods.
6. Lecturer's lack of understanding and awareness of societal needs.
7. Lack of student counselling services and academic advisory system.

IV. Instructional Problems and Methods/Strategies Used for Overcoming Them

Common instructional and learning methods in current practice

1. Lecture.
2. Tutorial.
3. Seminar/group discussion.
4. Verbal presentation by students.
5. Assignment.
6. Laboratory work.
7. Fieldwork.

Serious problems encountered in each method

1. *Traditional Lecture*
   - 1.1 A lack of understanding of the structure of knowledge by lecturers presents problems connected with the sequencing of lectures.
   - 1.2 The teacher-directed and dominated environment of the lecture.
   - 1.3 Students are passive recipients. They are unable to respond, and provide the necessary feedback so crucial for the teaching-learning process.
   - 1.4 Some lecturers do not possess the personality traits for the lecture method and a larger number are deficient in the knowledge of appropriate teaching/learning skills.
2. *Tutorial*
   - 2.1 There is a general lack of skill by lecturers in getting effective participation from all students.
   - 2.2 Lecturers in many instances are unable to give the necessary in-depth preparation for tutorials in terms of objectives, content and reference materials because of their heavy teaching, research and administrative workload.
3. *Assignment*
   - 3.1 Lecturers face problems associated with plagiarism, assigning of grades and providing adequate feedback to students.
   - 3.2 Students need greater guidance for doing these assignments.
4. *Laboratory Work*
   - 4.1 Laboratory work is generally planned for vertification rather than guided discovery.
   - 4.3 There is a need for valid assessment of skills developed by students.
   - 4.3 Laboratory work is time-consuming. Scheduling problems need to be resolved.
5. *Fieldwork*
   - 5.1 There is a need for planning fieldwork experiences which are relevant and appropriate to the aims and objectives of the area of specialization or course.
   - 5.2 Lecturers need to improve their fieldwork management and supervision techniques.

Constraints on teaching innovations

1. There appears to be a lack of recognition of the importance of the teaching function of the university.
2. The examination system in a number of universities is a major constraint to innovation in university teaching.
3. Administration, i.e. too much red-tape to get anything going, scheduling of courses and infrastructure.

4. Lecturer's fear of failure, lack of time, respect for older lecturers, traditional attitudes toward the role of a lecturer.
5. Lack of financial support.

Rewards/compensations for innovative teaching

1. Intrinsic — personal satisfaction.
2. Recognition by students.
3. Recognition by profession itself.

V. Supportive Infrastructure, Academic Staff Training and the Use of Educational Technology for Developing Effective Teaching-Learning Process

Infrastructure supportive of staff development

It is felt that the following supports are necessary:—

1. Moral — must come from both the administration and the academic staff.
2. Organizational — there is a need of a high-powered committee to reflect the importance attached to staff development, as well as to formulate and execute policies.
3. Financial — in the form of scholarships, fellowships, and grants.
4. Facilities and services — these are needed for conducting workshops, courses, and also for subsequent encouragement of innovative teaching and learning.
5. External — in terms of the provision of exchange programmes to enhance exposure to different and alternative systems of instruction.
6. Administrative structure to promote teaching-learning process on campus.
7. Time allowances in order to make good teaching possible.

Useful programmes/activities

1. Self-training in the skill of formulating objectives for units of study.
2. Observing experienced teachers teaching.
3. Inviting colleagues to observe own teaching, and being responsive to comments subsequently.
4. In-service workshops/seminars/residential courses on all aspects of university teaching and learning.
5. Student evaluation of teaching.
6. Peer evaluation of teaching.
7. Action research on teaching-learning problems.
8. Organize activities aimed at establishing closer rapport between staff and students.
9. Micro-teaching for self-appraisal.
10. Visits and exchanges aimed at teaching-learning improvement.

11. Counselling by staff developers.
12. Formal professional training leading to certification.
13. Post graduate courses in teaching and learning leading to formal qualifications.
14. Establishment of Resource Centre which could also act as a clearing house for information on teaching and learning.
15. Production of self-instructional kits, including Programmed Instruction.
16. Conferences for top administrators.
17. Practise team-teaching.
18. Systematic curriculum development at all levels.
19. Establish Unit to assist and advise on teaching-learning problems.

Establishment of media services

Activities which would cause the universities to initiate a media services centre

1. Create an awareness of the need to improve teaching and learning.
2. Create an awareness of the assistance available in already existing Units.
3. Identify innovative teachers and departments in order to illustrate the use of media.
4. Organize local workshops on media utilization and bring in experts on media services.
5. Enable existing services and media personnel to collaborate in assisting teachers.

Administrative support needed

1. Moral support.
2. Assistance in getting grants from outside institutions.
3. Provision of release-time or assign equivalent workload for staff development activities.
4 Financial support for capital outlay, maintenance and recurrent expenditure for replacement of equipment and software.
5. Provision of credit or reward for efforts in staff development.
6. Media centre administration:
   a) Need for more flexible working hours, more cooperative staff and minimizing red-tape in using the services.
   b) Establishment of links between media centre and individual departments.
   c) Production of instruction guides on media usage.

Professional and technical staff requirements

1. The staff for media services should include:
   a) Educational technologists to assist in the production of instructional material.

b) Audiovisual specialists to assist in the production and utilization of audiovisual material.

c) Evaluation specialists to assist in evaluation and research.

2. The director needs to be well-qualified and of high standing for credibility.
3. Other staff should include:—
   a) engineers and technicians for the maintenance of the physical facilities.
   b) good clerical staff to provide the necessary office support.

Facilities requirements

Facilities should meet the following criteria:

1. Economical
2. Only basic facilities be provided.
3. Robust
4. Compact
5. Versatile
6. Easy to maintain.

VI. Considerations for the future

1. Establish infrastructure to facilitate staff exchange among institutions:
   a) within the country, and
   b) in different countries.
2. Establish a joint-committee in the Asean Region for planning university teaching-learning improvement activities.
3. Establish regional staff development centres in the country.
4. Organize conferences on more specific themes in university teaching and learning e.g. examination and assessment, learning styles of university students.
5. Universiti Sains Malaysia would act as the "contact" institution in university teaching-learning matters.

APPENDICES

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PAPERS ON GOALS AND OBJECTIVES OF UNIVERSITY EDUCATION

1

GOALS AND OBJECTIVES OF UNIVERSITY EDUCATION — WITH SPECIAL REFERENCE TO DEVELOPING COUNTRIES

by
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Abstract:

1. University education goals and objectives vary from country to country and in the same country from time to time.
2. Developed countries do not require much planning of their university education.
3. Not so with developing countries where university education has suffered long years of neglect and much has to be done within such a short time.
4. Goals and objectives of university education in Malaysia:—
   a) In the early years of independence — to produce administrators and managers for both Government and the private sector quickly.
   b) After that to diversify — to produce scientists, doctors, dentists, pharmacists, engineers, economists, accountants, lawyers and so on.
   c) To produce its own core of local professors.
   d) To produce graduates:
      i) with relevant skill;
      ii) in sufficient number; and
      iii) not to overproduce.
      Manpower planning important.
   e) To produce intelligent, thinking, rounded people, not mere technicians and mechanics — people who are not afraid to think for themselves.
   f) To help build up a united nation. Bahasa Malaysia is very important in helping build up a United Nation. But at the same time it is also very important that our universities produce graduates proficient in English, so that they can communicate with people anywhere in the world.

Universities are very expensive and in a developing country there are few rich benefactors who can afford to finance them, and so the money for them has to come from public coffers. In other words, from the taxpayer. The taxpayer does not mind the Government spending vast sums of his money, provided they are spent wisely, for he expects and is entitled to expect value for his money.

University education has definite goals and objectives. What they are vary from country to country for no two countries are the same. They have different geographical features, different histories, different traditions and cultures, and have developed at different rates. They are at different stages of developments and have different needs and therefore different priorities. Even in the same country the goals of university education vary from century to century, from decade to decade as needs and priorities change.

Developed countries with universities founded five or six centuries ago and developing steadily, can take a relaxed attitude and do not require much planning. They "took off" many many years ago, and have enough momentum to fly along on the wings of knowledge without conscious effort. Their professors can afford the luxury of pure research and unlimited time for thinking and writing.

Developing countries on the other hand are quite different. Take Malaysia for instance. During the many decades before independence, Government provided only primary and to some extent secondary education; even then only for the purpose of producing clerks and such subordinates. There was hardly any attempt at tertiary education.

Only a few Malaysians managed to go to Raffles College and the Medical College at Singapore, and a mere handful managed to go beyond, to England.

The first attempt at establishing a university was in 1957 when a branch of the University of Malaya then in Singapore was opened in Kuala Lumpur, which branch was later established as a separate University of Malaya, the mother university being renamed the University of Singapore.

On attaining independence on 31st August, 1957 — the Government was faced with two problems:

a) how to find skilled manpower to take over the administration — that is in the public sector; and
b) in the private sector — how to bring about economic independence, for political independence alone is not enough.

In solving these problems, ideally Government should move in the two sectors simultaneously. But that was impossible, so Government concentrated first on the public sector.

Some 3,000 expatriate administrative and professional officers were leaving the country and suitable local officers had to be found to take their place.

Administrative officers were given an opportunity to stay on for a period of five years after independence and professional for a period of seven years, and some stayed on for that period.

It was urgent that Government should during the first period of five years produce administrators and thereafter professional officers — from within. Recruiting them from overseas would have brought only temporary relief.

Thus it came about that during the early days of independence Government allowed the University of Malaya a free hand in teaching mainly arts subjects — apart from engineering which was in fact the first faculty to open — and it was only in fairly recent years that Government started to encourage our universities give more attention to professional — and scientific — subjects.

This illustrates the first two goals of university education in a developing country.

First, to produce — and quickly — the kind of graduates that are needed urgently. In Malaysia's case, they were graduates educated in the liberal arts*

*The late J. Paul Gethy, whose success in the oil industry is well-known, says that despite today's emphasis on specialization, it is truer than ever that the ladder to the upper echelons is based on the liberal arts, and that in today's corporate complex the jack-of-all-trades has a good chance of winding up the master. See his book *How to be a Successful Executive*, chapters 4 and 5, published by Wyndham Publications Ltd., London.

to serve as administrators and managers both in the public and private sectors. As it happens, teachers to produce such graduates are comparatively easy to come by, and the facilities required are not elaborate — lecture and seminar rooms, a good library and so on.

Second, to diversify courses, to meet other needs — also urgent but not as urgent as the need for administrators and managers — especially the need for professionals, like scientists, doctors, dentists, pharmacists, engineers, economists, accountants and lawyers and so on. Producing such professionals is not as easy as producing administrators and managers. Teachers have themselves to be professional men and most of them can make a very good living in the private sector, and universities have to compete for them on unequal terms and depend on a small number who are willing to sacrifice money for job satisfaction in research and teaching.

Relatively speaking Malaysia is a rich country but our experience has been that money alone cannot solve all problems. More problematical is how to recruit and having recruited them how to retain professors, for they are in demand in many countries and we have to compete on the world market for them.

Our experience is that we cannot depend greatly on expatriate professors. They are happy to come (and we are happy to have them), but most of them wish to stay only a few years to gain experience teaching in another university and living in another country and plan to return to their own university or to move on to Australia and New Zealand.

So here we come to the *third* goal of university education, and that is that our universities must build up a core of local professors by persuading our best graduates to join faculty, and devote their life to an academic career finding satisfaction in the even tenor of campus life. Top graduates are enticed into staying on first as tutors, and then after a few years by being sent overseas to work for a second or a third degree. This was the experience of American universities two centuries ago, and we follow in their footsteps.

Another experience of ours is in the rate of growth. Because we have so much to do and so little time to do it — because of the neglect of past years before independence — the premier university, that of Malaya, for long the only one in the country, tended not just to grow but to grow very fast. While this was a good thing from the nation's point of view, it was not such a good thing from the internal point of view, as it created administrative problems within the campus. Fortunately from 1969 other universities began to be founded, and the University of Malaya has been able to stem the tide of its growth, to consolidate and take stock, so that today it is the most stable institution of higher learning in Malaysia — like a man in his mid twenties who has lost a lot of his puppy fat, is healthy and full of self assurance.

In the process of diversifying, Malaysia came across the *fourth* goal of university education, and that is, it is not enough merely to produce graduates that are needed urgently. We must produce:

a) only those with relevant skill;
b) in sufficient number; and
c) as a corollary we must not overproduce.

As to (a), in the early days for the arts graduate the world was his oyster, and not only could he get a job easily, he could also, to his employer's dismay, hop from job to job without any trouble and with each move improve his earning and prospect. Not so now.

Many have to wait months before finding employment.

As to (b) and (c), in the early days there was a shortage of civil engineers and the University of Malaya concentrated on producing them. Then there was a shortage of mechanical engineers and emphasis was given to producing them. Similarly with chemical engineers. Now we read of engineers of all kinds having to wait and wait before finding jobs in Government and in the private sector.

In the case of law — we had no law Faculty until 1972, seven years ago. Until then it was thought that as lawyers are well to do they can be left to "reproduce" themselves in Singapore, London and so on; but as overseas institutions gradually shut their doors to budding Malaysian lawyers Government agreed to open a law faculty. During the first six years the annual local intake was 50 students, a very small number necessitated by shortage of teachers; but last year it was doubled. It will be at least another two years before the output of lawyers will be doubled. In the meantime the country is suffering from a shortage of lawyers, and in the near future the University of Malaya may have to increase its intake again. There is talk of the National University opening a law faculty; but in view of the difficulty of finding teachers of calibre the sensible thing to do — at least for the next 25 years or so — is to expand the Law Faculty that we have now rather than duplicate, and waste scarce manpower.

Manpower planing is important. Universities do not exist in a vacuum. They exist to serve the community — more so in a developing country. There must be some persons — or body — keeping an eye on what kind of graduates are needed and how many and when. Universities are not organized to forecast such needs, so Government must do it. Otherwise there might be wasteful duplication. Everybody agrees that there should be manpower planning. Everybody also agrees that manpower planning is easier said than done, even by highly developed countries. That notwithstanding, it should be attempted and not neglected.

I talk of producing skilled graduates, graduates with the necessary skills, and so on. This is inevitable in a developing country. But at the same time I must emphasize another goal — the *fifth* — of university education even in a developing country — and that is to produce intelligent, thinking, rounded people, persons who are not mere technicians and mechanics, robots, who take for gospel truth everything they are taught, everything they hear and read, persons who stop reading the moment they have received their degrees from the Chancellor, persons who never buy books thereafter, persons who think that only they are right and want to ban opinions with which they do not agree. Mankind owes advancement and progress not to conformists but to persons — a tiny minority — who make themselves unpopular because they are not afraid to think for themselves.

Nevertheless, for the next few decades universities in Malaysia will have to concentrate on producing graduates with skills that are relevant to the peculiar needs of our country, subject to the qualification I have just mentioned. Subjects taught should be relevant; and project papers, theses, research should all — or most of them — be relevant to our peculiar needs. Unlike developed countries which have taken off, we should not pursue learning simply for learning's sake — to produce musicians, poets, and the like.

In the peculiar circumstances existing in multi-racial, multi-lingual, multi-religious and multi-cultural Malaysia all universities should have, in my view, the goal — the *sixth* — of building up a united nation — a very important goal for us. Thousands of young people of all races rubbing shoulders every day on the campus, in the lecture hall, in the library, on the playing field, in the canteen, should get to know each other, understand each other's opinion and prejudice, should develop understanding, should be tolerant of each other's foibles, and in after years in adult life maintain the friendship formed on the campus.

In this area, the importance of a common language, Bahasa Malaysia, cannot be overemphasized. The need for it is no longer controversial, and there is no need for me to make a special plea for a language that will enable Malaysians, certainly those who have grown up since independence, to communicate not only with their mother and father and relatives but with all Malaysians everywhere.

I do however wish to make a special plea for the English Language. My views on this are well-known to all though unpopular with some. The goal of Malaysian universities — the *seventh* — should also be to familiarize their graduates with this very important language. It is no longer a colonial language. More foreigners know it than the English, and they are to be found not only in the USA and the white Commonwealth countries, but in every country in Afro-Asia, on the European continent and in South America. Science has made the world small, and we have commercial, political and cultural dealings with people from all over the place, such as Arabia, Egypt, Iran, Pakistan, etc. — and how are we to communicate with them except through English?

It will be a tragedy if our universities produce graduates equipped only with one language with narrow outlook like the proverbial *katak bawah tempurung* (frog living under a coconut shell) without access to the thousands and thousands of books in the English language on every subject under the sun. Our leaders should have the courage to resist the pressure of language fanatics and chauvinists who make it difficult to carry on a rational debate and discussion on this issue.

2

NEW GOALS AND OBJECTIVES OF UNIVERSITY EDUCATION: EXPLORATION OF SOME TRENDS IN ASIA

by
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There has been growing realisation, more in developing than in advanced countries, that education represents a facet of overall development of a people and serves as an interacting component of all aspects of development.

The term 'development', particularly the need for training of manpower for such development has, in the past, been defined rather narrowly as synonymous with economic development, with almost exclusive attention on the modern sectors of the national economy, and with uncritical acceptance of naive cause and effect relationship between trained manpower and rate of development, given supplies of adequate capital. Some serious problems have emerged: unemployment and unrest among the educated, including those with diplomas and degrees in technological subjects; slow rate of economic growth, despite the creation of the infrastructure and other conditions for rapid growth; marked and increasing disparity in the income and power of different groups of people within the countries; and increasing gap between the rich and poor nations despite the planned efforts for catching up.

Both the concept of development and the concept of education, as well as the relationships between the two, have undergone dramatic changes. In consequence, University education is assuming new roles, and its educational programmes are fostering closer and interactive relationships with its other activities, research and extension.

Goals and objectives of education have undergone fundamental changes, even though some of the changes are manifested more in the realm of re-organization of educational systems and the innovatory institutions and programmes than in the statement of educational aims.

Goals and objectives of education

University as an abstract entity cannot have goals. What we can consider is the purposes of the groups of people (government and people of the countries) who support, staff (all categories of staff, in particular those involved in research, teaching and research) and the students and the communities (who benefit from the University's teaching and extension functions). The purposes of these groups serve as goals and influence the orientation of University education.

More definite objectives need to be spelt out to establish plans of action and evaluate the achievements. This is not an easy task, as we all know. The decision to assess certain types of changes could be interpreted also as an im-

plied judgement to treat these changes as the most significant. Also, the real outcomes of education may not be measurable except in holistic terms and even so, only in relation to, and as a component of, the on-going process of development. However, one may attempt to prepare a priority list of objectives in terms of the identified problems and shortcomings of the existing programmes of University education. Some of these would be measurable, others tangible but not quantifiable, and still others would involve a considerable degree of subjective judgements.

Goals

The purpose of the government and the people who create, maintain and support University education is their expectation of vital contributions that a University makes to national development, by way of preparation of high-level manpower, extension programmes, and preparation of studies for generating alternative courses of action for achieving national development goals. The students are interested in acquiring qualifications for social status and jobs. The staff of the University is concerned with extending the frontiers of knowledge within the context of their disciplines, and training a body of students for the national needs and those of the Universities for research and teaching. All these groups are equally interested in the personal development of students and in their having the philosophy of life which includes high moral standards, and commitment to continued social and personal development based on social, moral and aesthetic sensitivities. Habitual practice of these virtues is vital for development of a nation, self-fulfilment of the students in their milieu, and the life and vitality of a University.

That the contribution of University education to the national development is treated as the major goal in Asia, is clear from the place accorded to this role of the University by Asian educational pioneers and governments.

I would recall in this connexion the seminar hosted by the University of Malaya from 29 January to 2 February 1973, which was organised by the International Association of Universities. The topic chosen for this seminar was the social responsibility of Universities in Asian countries: obligations and opportunities. More recently, in 1978, the Fourth Regional Conference of Ministers of Education and Those Responsible for Economic Planning in Asia and Oceania (MINEDASO IV) observed in one of its recommendations that "..... the role of education is to be found in the specific socio-economic, cultural and political conditions obtaining in each country, and is in a large measure determined by those conditions but should at the same time contribute to their progressive improvement."

For proper appreciation of goal of education in development process, it will be pertinent to note the concept of development which underpins Unesco's Medium Term Plan as articulated by the nineteenth session of the General Conference of Unesco. The development is interpreted as ".....an overall, multidimensional and diversified process essentially endogenous in nature, linked with the values peculiar to each society and requiring the active participation of individuals and groups who are its agents and beneficiaries."

University education in Asian setting could be treated as pursuing the major goal of contributing to national development through its three-fold activities of research and scholarship, teaching and extension. It cannot make

an effective impact on the national scene, except by (i) equipping its students with the necessary skills and knowledge, and inculcating in them values and sensitivities which enable them to fulfil themselves and participate in the building of the nation and their communities, and (ii) by institutional commitment to relevance and excellence.

Objectives

As for the objectives of reform of higher education, by which I mean the priority objectives of University education at present in Asia, one may consider the themes of the IAU seminar in 1973 on the social responsibilities of the Universities. These were: (1) The University, Language and National Identity; (2) The University, its Graduates and the Labour Market; and (3) The University, its Innovatory Role in Society. It would be of interest to consider the assessment of higher education made by MINEDASO IV in 1978. MINEDASO IV noted that a slow but sustained transformation is taking place: more resources are devoted to the improvement of scientific and technological education; greater weight is being given to applied research; extension programmes which benefit both the nearby communities and the applicability of what students learn are becoming a common feature; closer relations are being forged with government development agencies and the industrial sector; more suitable forms of post-secondary education such as open university type of institutions are being created; initiatives are unfolding for evolving new functions and structures of higher education to relate them to endogenous development from which they had been so long alienated. The delegates emphasized the need to re-appraise the quality, relevance and social context of higher education in the face of mounting numbers of educated unemployed and exceedingly high unit cost per student.

It will be seen that several growth points in terms of initiatives have emerged in respect of the problems to which the IAU seminar in 1973 was devoted. The endogenous development of education, the problem of the educated unemployed, and the creative and innovative role of Universities continue to figure as the prominent concerns of the Asian Member States of Unesco.

The four main trends of the reform of education undertaken in Asia are: widening and diversifying access to higher education for promoting social and human equity and for reducing the imbalance between urban and rural zones; participation of higher education in the development of the community; strengthening of ties between the Universities and the production section. In view of these trends, traditional University teaching should re-examine the pertinence of its social role, taking into account, notably, the existence of private institutions and the high unit costs. Research on new methods of education and innovations in pedagogy of higher education need to be emphasised.

The objectives of educational reform can be frustrated if the new conception of development and the role of education in such development is not reflected in our concept of efficiency in education and the related criteria and instruments of evaluation. MINEDASO IV has made pertinent observations on these aspects of the teaching-learning process and I would like to quote them since it will be important for the substantive discussions during this Conference:

1. **Efficiency:** ".....[there is] the need for a broad interpretation of the 'concept of efficiency' in education, one which takes into consideration the wide range of education's functions in the modern world and its importance for development."

2. **Research:** "The discussion in the Commission stressed the need for an appropriate research base which would permit a more effective interlinking of educational reforms with the demands of economic, social and cultural development. Several delegates showed concern at the fact that university-level research had devoted itself more to academic subjects than to the problems of national development. More often than not, research priorities and theories originating from more industralized societies had been uncritically assimilated by developing countries whose circumstances and needs were fundamentally different.

   "Particular emphasis was laid on orienting educational research towards major issues encountered in educational reforms..... not only at the design stage, but also during the implementation of educational reforms."

3. **Evaluation:** "The need to go beyond this type of summative evaluation to a more qualitative assessment of reform outcomes was emphasized. Much work remained to be done in developing evaluation techniques not confined to quantitative and economic dimensions, but equally sensitive to the social and cultural repercussions of educational reform and renewal."

'Extension' the motive force for change: A comment

The University activities — research, teaching and extension — have been conceived as integrated set of operations, with priority assigned to research which guided both teaching and extension. The social role and responsibility of the University, and reform of Universities to contribute to national development has, in my opinion, shifted the focus on to extension, which in turn is guiding the content, methods and media of instruction on the one hand and indicating new forms of, and problems for, research. Even the locale of University activities has undergone a dramatic change, with the field work, rather than laboratory or classroom activities, emerging as the cutting edge of innovations and reform.

Many new developments in education, including open universities and other open and distance learning systems, and some new educational structures within the Universities and their programmes (such as of social service, work experience and participatory research) could be treated as the further development of 'extension' function of the Universities, to which the methods, materials and techniques, originally established for extension have contributed a great deal.

I would like to recall how 'extension' in the first place become a role of the Universities.

University education has traditionally performed two roles, namely, teaching and research. With the advent of higher education in agriculture and technology, a new role was added, namely, extension. This new role remained limited for a long time, largely to agriculture and its counterpart for women,

namely, home economics. The extension function could be subsumed under teaching because it involves education of the groups of population not enrolled as students in the University. However, this third function was radical in its implications: the very concept of a University, its structure, its functions, and its 'student body' all underwent fundamental changes. The University was no longer to be a mere 'knowledge producing' and 'training' organization: it undertook signal national services and provided these outside of the precincts of the University. This interaction occurring outside the Universities was a mutual learning- teaching situation between the University staff and the people engaged in some productive activity. It is well known that this innovation was not initially well received by the Establishment. No innovation is. There was resistance to accord University status to the studies which departed so much from the conception and operating principles of the traditional places of higher learning. At the initial stages, therefore, such institutions had to be established outside the University systems. Special patronage and financing were provided by governments to keep them going and until they achieved respectability and legitimacy, and accepted as University level institutions.

It would be wrong to suggest that Universities were, in their primary commitment to continuing search for truth, inimical to serving the immediate practical needs of society. The training of physicians, priests and lawyers has always been regarded as one of the central purposes — or among the core concerns — of Universities. Since their training was verbal and University-based like that of the general run of liberal arts students, there was no apparent conflict between general education in liberal arts and training for these so-called liberal professions.

I intend to present a few specific exemplars of the new institutional forms in Asia, which embody the new goals and objectives of University education in this region, and will attempt to explore:

a) How University education is being transformed by new types of extension programme;

b) How new types of University education programmes are emerging as self-contained development institutions, with the triple role of research, training and extension, all performed in new style and spirit, to relate education to development of society and to involve the disadvantaged and deprived sections of society in all the roles;

c) How the structures of organization and curricula of University are likely to change, with profound implications for teaching-learning process and educational technology.

My purpose in bringing these changes, occurring now or foreseen, is to invite attention to the trends in education, consonant with new goals and objectives, which need to be considered in considering the substantive matters before this Conference.

Some Innovative Endeavours

The interaction between institutions of higher education and society, particularly the most disadvantaged rural poor, is being encouraged under a variety of programmes. In several countries now, the students (and in some

cases, staff also) spend a period of time living in rural communities, serving their needs either as teachers or participants in other development activities. Such programmes are of recent origin, still beset with problems, and not yet assured of continuity in their existing forms. Educational advantages claimed are immense: the opportunity to empathize with disadvantaged and deprived people of the country; experience of living under trying conditions; applying their specialized knowledge to unforeseen problems; experience of team work, design and development of plans, communication of projects, implementation and evaluation of reforms; noting gaps in one's training and the irrelevance — more often than not — of the scheme of reforms prepared without involving, or even communicating with, people. There are, of course, several pitfalls, such as the problem of cultural shock; likely waste of time of future top-ranking mathematicians and scientists; opposition from city-bred, affluent students who perhaps need this exposure most but resent just as much. Under this approach, both the students rendering service and those receiving the benefits gain. But the feedback into the curriculum of the formal education itself is not appreciable.

The second approach is a more systematic, multi-disciplinary, and sustained effort at the involvement of students in community development, in which the service rendered by the students is planned as a high quality professional work, the communities interact with the students, and the experiences and outcomes of the service in the rural areas are constantly fed into the curriculum of University thus constantly renewing the programme and raising the level of students' performance and learning. The whole programme is designed as a quasi-experimental endeavour, to ensure that feedback provides guidelines for action or further probes, and the elements of the programme and their mutual relationships are adjusted on a continuing basis.

A most illuminating account of this approach in the materials available with my office, is that of the Comprehensive Community Health programme of the University of the Philippines. Here are a few excerpts:

> The Comprehensive Community Health Programme (CCHP) of the University of the Philippines was conceived in 1965 as a response to the concern of the University, especially among the health science disciplines, to provide education relevant to the needs of the country. It has been felt that teaching and learning activities occur mostly within the school campus, and especially for the medical sciences, mostly within the hospitals. The University, therefore was considered an "Ivory tower" quite separate from the existing communities, and producing graduates from the health science discipline who are not really knowledgeable about the realities of problems that are presented by the people, especially in the rural areas where 70—90% of the population live.
>
> Starting as a movement within the College of Medicine, the programme was launched in co-operation with the College of Agriculture in a rural area in the province of Laguna as an extramural laboratory for fifth year medical students of the College of Medicine. Soon, more health science disciplines joined the programme such as dentistry, nursing, pharmacy, public health, occupational and physical therapy, community nutrition and veterinary medicine. Other related disciplines also joined such as social work, community development, and those concerned with population and demography.
>
> The CCHP Board is composed of Deans and Directors of the other participating units of the University, with the Director of the Programme as an automatic member of the Board, aside from the two representatives coming from the Ministry of Health. The CCHP Board is a policy — and decision-making body, formulating general guidelines and policies, co-ordinating the participation of various colleges, and reviewing performance and achievements.

Because of its interdisciplinary nature, the programme became a separate unit from the College of Medicine in 1969, but remained very closely co-ordinated and related with the "mother units" which consist of the participating units of the University. Through the full-time faculty members of the CCHP from each discipline (e.g. medicine, nursing, nutrition, etc.) co-ordination with the mother unit is facilitated.

The full-time faculty members are assigned to rural areas to train students coming from the participating units. The training of these students, coming from the "professional training programme", is of the "exposure type". The students live and learn with the faculty members in the real-life situations of rural communities.

Aside from the professional training programme, the CCHP also has research and extension service programmes to enrich the professional training programmes. Research programmes are usually of the action type.

The frame of reference held by each discipline dealt more with particular intra-disciplinary concepts that usually conflicted with other disciplines.....an interdisciplinary Curriculum Committee was organized in 1972.....to come up with a core curriculum.....[for] field placement.

The analysis of pre-placement capabilities of students as well as consultations with mother units regarding what courses should be offered by them before field placement resulted in varying degrees of modifications in the entire curriculum of a mother unit.

The main criterion (aside from those cited above) for identifying the elements of the core-curriculum is that what will be learned will not only make the student more competent professionally to work in a rural area, but also to make him more responsive to the needs of the people.

The third approach is the establishment of development University, drawing up its principles of organizing its activities so as to serve the need for an integrated socio-economic development.

This trend, still in its infancy, is bound to grow. Changes in education are first embodied in new types of institutions or in the existing institutions as extra-curricular activities, before these are accepted as proper subjects or areas of study by the main steam of education. Here is how a development University was conceived in Iran:

Bu-Ali Sina University is essentially a 'development university' which helps provide the human resources and the knowledge required for an integrated socio-economic and cultural development of the rural-traditional and less developed strata of the country. Its approach to education and research is functional rather than academic, inter-disciplinary and problem-oriented rather than discipline-base.

The University will be oriented towards the application of science and technology and thus, its graduates are expected to apply their knowledge to problem-solving and for innovation purposes.

Apart from the administrative staff, the University is organized in four 'clusters' (roughly colleges), each centred around a major problem-area and subdivided into a number of 'Areas of Concentrated Studied'. These are 'Agriculture Cluster' (in planning), 'Education Cluster', 'Environmental Sciences and Ecodevelopment Cluster', 'Health Sciences Cluster'.

Move in this direction is discernible in several Universities, in the shape of degree programmes and development projects which fit the defining feature of a development University. More forms of problem-solving and inter-disciplinary orientation are likely to be devised and introduced.

My next example presents an even more extreme form of a University education. As at present operating, it is an experimental baby of an autonomous and prestigeous national institute of management in India, which has teaching, research, extension and consultancy programmes. The outcomes of the experiment, which has been installed in all seriousness as an educational programme, are influencing the thinking and operations of the 'parent' institution. I am reproducing below some excerpt from a report:

The Rural University has started.

How does the Rural University work? Obviously it must start somewhere, some time, with someone. It started in August 1975 in a backward block of about 200 villages with a populaton of approximately 80,000. A small group of persons interested in education wished to experiment with the integration of rural development and education by using learning as the basis for development. It was thought that developmental activities should be the vehicle of earning. People would learn in the course of doing things, but the activities themselves were regarded as secondary. The focus was on people.

It requires no direct institutional funding either from the Central or State govenments. It has no overall blueprint plan nor has it a budget. It requires no rules, procedures, sanctions or controls except the self-discipline of the individual that comes with a real desire to learn.

The Rural University assumes that the development of rural India will occur, not through mere target-oriented plans, but through the development of people. Development activities without the deep involvement of people are without foundation. Involvement is not susceptible to the imposition of time-bound targets in the way that physical and financial inputs are. People must learn to help themselves, to help others, to help their community and to help other communities. Self-reliance and mutuality are basic to the idea of the Rural University.

This University is a locator, enabler, provider and organizer of learning space wherever the opportunities for learning might exist or be created. These spaces might be at a villager's hut, round a well, round a tanning pit, a tea shop, a school room, a roadside, a government office, a field, a mohulla, a co-operative society, a bank counter, a market place, in a vehicle, at a dark bungalow. Learning in this University can occur anywhere.

The University is concerned with people of all ages, all castes, professions, vocations, but its main initial thrust is directed towards the disadvantaged for whom learning can be the base from which they might extricate themselves from the web of circumstances which has held them economically and socially captive.

So the membership of the University consists of farmers from small to large, artisans whether they be caste based or otherwise, labourers both agricultural and industrial, government servants, teachers in the formal system, independent volunteers, school children, bankers industrialists and businessmen, educationists, researchers, technologists. The community of members does not have a formal identity. If a sense of identity develops it will emerge from the realization that a common bond exists, having shared learning spaces which they helped create.

The involvement is not, by any means, uniform. There are some experiences which are limited to specific groups of people. There are levels of involvement from the total to the peripheral and of learning and doing from the very active to the slow. Nevertheless, they have all been involved with the Rural University.

The naive experimenters, who (unknown to them at the time) were the first members of the Rural University, were under its aegis, the first to learn by their mistake that the reality of involvement, self-expression and self-development at which the University aimed, could not be achieved by depending, except in a supportive sense, on the formal channels of power and authority, but would have to grow organically from the amongst the people to whom the idea was most relevant — an obvious and somewhat simple but vital lesson.

It is commonly understood that there is a considerable divergence between the expressed intention to do something and the actual doing of it. The problem is to understand the nature of the intervening variables that influence the transition from intention to action. This was the second lesson which the experimenters learned — the manipulations of vested economic power to gain control of new resources intended for others.

It has always been assumed that the several functions of a University are to be seen as mutually supportive. Creation of knowledge (research), followed by its transmission (teaching) and its continuous appraisal for refinement and renewal (more research). If extension function is also to be included in this cycle, then we have another form of teaching, at a different level, with a different clientele, but the clientele in that case field-tests the knowledge and provides feedback on its applicability or otherwise and also

assesses whether the knowledge, in the form it is created, is relevant and what other problems exist for which researches need to be mounted.

One of the criticisms of University education is its reluctance or indifference to subject its own programmes — contents, methods of teaching and evaluation, materials, etc. — to research and development for their periodic renewal.

In the examples of innovative endeavours cited earlier, the Universities have depended on the initiatives of individuals or groups, with a passion for change, to initiate reforms. It has too often been assumed — with some justification, no doubt — that the people trained and involved in research can teach because of their personal attachment to their subject matter, particularly their own findings. This notion could be profitably communicated to school teachers, who seem to have neglected the effect of teachers' commitment on student learning. University education, nevertheless, stands to gain from exposure to purposes, strategies, materials and methods of teaching. Some initiatives are reported.

These include:

i) Setting up of curriculum development centres and centres of educational technology within the Universities;

ii) Education of University teachers in pedagogy and related fields either through in-service education, or master level degree programme in teaching of particular science or technology, which are generally planned and administered jointly by the substantive and education departments.

I have limited the account of innovations in higher education to those directly influencing the domain of University education. It should, however, be mentioned that the establishment of new types of post-secondary education institutions, particularly to reduce educated unemployment, by directing their training to jobs available in the communities, or to prepare them to act as entrepreneurs for small-scale business and industrial operations, is a promising development. Mention should, however, be made of the several types of open universities which are in various stages of development in Asia. In several cases, these institutions cover the need for education at the lower levels, particularly for teachers and vocational and agricultural fields, but in other cases, they may provide education similar to degree programmes in Universities. Although established for meeting the needs of disadvantaged groups, it remains to be seen whether these institutions succeed in meeting this special need, or lead to further disparities in opportunities for education between the already privileged and disadvantaged groups of population.

In respect of goals of education, it would appear that Asian universities are moving towards a better link between them and society and developing new strategies and programmes to involve the poor sections of the society in their own development. In this process, the content, language and methods of study on campus and field studies would be made more relevant in meeting personal and social needs of the whole society. This trend is supported by governments and political leadership of the countries so that the experiments in endogenous development of Universities are growing apace. The

corresponding changes in the admission procedures, criteria of selection and methods of evaluation in the degree programmes of the University need, however, to be adjusted — for which field programmes are providing the stimulus so that advance is made toward reduction of imbalances between urban and rural population; and the links are established between Universities and the community and between Universities and the production sector. This will occur when a variety of educational innovations in off-campus programmes begin to characterise the University activities on campus also.

The present Conference, I hope, will be a landmark in reviewing the existing situation pertaining to teaching and learning process, which could provide a stimulus to development of new methods, materials and techniques of University education.

I would briefly review now how Unesco's activities, continuing and those planned for immediate future, would benefit from and build further on the outcomes of this Conference.

Selected Unesco Activities Relevant to the Theme

Unesco has been co-operating with the Regional Institute of Higher Education and Development (RIHED) which promotes exchange of experiences of linking higher education to development in four countries, namely, Indonesia, Malaysia, Singapore and Thailand. Typical of the work of this organisation is a Regional Seminar on Higher Education and Basic Health Needs, held from 21 to 23 December 1978, where participants from medical faculties of institutions of higher learning and government officials in the countries of Southeast Asia reviewed their experience of higher education and basic health needs. Among the cases presented, there were: the community medicine teaching, a project on developing educational strategies and health care in 60 villages of the University of Airlangga, Indonesia, involving medical students in learning the basic sciences of modern medicine in an integrated form and undertaking a field programme, serving both educational and service goals. Under another project which Thailand presented at the seminar, students perform field studies in the villages during their medical training and adjustments are made in the medical curriculum on the basis of the health needs in the rural areas as identified under the project.

MINEDASO IV emphasized the need for regional co-operation in innovations in higher education. The Director-General of Unesco was invited to convene a study group to consider alternative forms of regional co-operation for promoting innovations in education linked to development efforts. The Unesco Regional Office will invite the study group early next year. As a result of the recommendations of the group, hopefully, the conferences like the one we are attending now would be held more frequently.

New procedures of admission and new evaluation criteria and procedures are necessary to support and sustain innovations which seek to resolve the problem of unemployment, promote equalization of opportunities to different population groups, foster links between communities and the production sector; and facilitate the introduction of a new pedagogy of higher education. Even the existing reforms, which are not as pronounced as envisaged, have generated a sense of disparity of standards between institutions and between countries. Therefore the need for periodic consultations.

To promote mobility of students and teachers, Unesco is in the process of preparatory work for a regional convention on the recognition of studies, diplomas and degrees of higher education in Asia.

Still another regional activity, a symposium on goals and theories of education, is proposed to be held soon. The themes for consideration would include, among others, content, methods and training techniques in relation to environment; and education and mass media.

In concluding my observation on the forthcoming activities of Unesco in Asia in the field of University education and cognate subjects, I would like to read out to you an extract from the Declaration issued by MINEDASO IV on the conclusion of the Conference.

> "The Conference
>
> *Deems it essential* that the Member States of the region, endeavour to improve the quality of education and make it more relevant, not only to modernizing it and gearing it to development objectives but also by rooting it in national, cultural and human values;
>
> *Invites* Unesco, in collaboration with other international or regional organizations concerned, to continue and intensify its regional action with a view to fostering technical co-operation between the countries of the region, in particular developing countries, and in this connection to strengthen the regional co-operation machinery operating within the framework of the Organization and arrange for it to be extended to the field of higher education.

PAPERS ON CHARACTERISTICS OF UNIVERSITY STUDENTS AND THEIR LEARNING PROBLEMS

3

CHARACTERISTICS OF UNIVERSITY STUDENTS IN MALAYSIA AND THEIR LEARNING PROBLEMS

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Before proceeding to discuss the problem before us, it is necessary to clarify three positions, right at the outset. First, this paper is not an attempt to present empirical findings from systematic studies. There are no such studies carried out so far in this country. Such being the case, whatever propositions presented in this paper, may, at best, be considered speculative, and should be treated as probable hypotheses that might be of some use to those who are planning to do research on the subject. In other words, the discussion that follows is intuitive in nature and based, to a very large extent, on the present writer's own personal experiences and observations.

Secondly, it is necessary to make it explicit that we are talking about relationship between two sets of variables, firstly, characteristics of university students, and secondly, their learning problems. As suggested by the term 'characteristics', university students may be classified into a number of categories. In the language of research, these categories are the independent variables. Likewise, learning problems may be categorised into various types. Unlike characteristics of university students which may not be too difficult to list, learning problems are relatively more difficult to identify. Learning has many dimensions each of which needs to be clarified before we could attempt to relate them to the characteristics of university students.

Let me propose some characteristics of university students in Malaysia that may be of some consequence to their learning problems. These characteristics are: sex, demographic origin, age, medium of instruction through which they have learned other subjects in schools, ethnic origin, disciplines or streams they are in at the university, students' state of emotional stability, and students' state of physical handicap.

We then have the following variability:

1. *Sex:* male, female
2. *Demographic origin:* urban, rural
3. *Age:* fresh from schools, adults with some working experience
4. *Medium of Instruction:* Malay, English
5. *Ethnic origin:* Malay, Chinese, Indians, etc.
6. *Discipline or stream:* arts, science, economics, etc.
7. *State of emotional stability:* Emotionally stable, emotionally unstable
8. *Physical handicap:* Present, Absent.

As for learning as a dependant variable, we will of course confine our discussion to only university learning. In my opinion, university learning is made up of the following dimensions:

a) University learning involves *independent and thorough search for reference* intended to further clarify and verify what have been given in lectures.

b) University learning is *interactive learning* by which is meant that it is a two-way process; that learners must learn to be active in their minds when listening to lectures, and they must be active verbally, as well, when attending tutorials. Learners are not supposed to be passive recipients of knowledge. On the contrary, they must react to what is being told or presented to them, for purposes of verification, clarification and expression of agreement, disagreement or reservation.

c) University learning has a lot to do with *critical thinking* and ability to see things from as many points of view as possible, and then to synthesize and come up with solutions or alternative views.

d) Critical thinking and establishing relationships between events or variables demand a high degree of *intellectual discipline* in the forms of precision in thought and presentation, and uncompromising attitude towards validation and verification of facts, and critical evaluation of their sources.

e) University learning involves both *theorizing and applications.*

f) University learning, though has a lot to do with theorizing and problem solving, depends basically on *mastery and command* of facts and/or formulae.

g) University learning demands intellectual *perseverance and honesty* in the pursuit of truth.

Students may find some dimensions of university learning as attainable while some others difficult to master. A typically ideal university student is one who should be able to score high on all these dimensions. However, subjects taught at universities may vary in their emphasis along each of the dimensions. Language classes, for example, place greater emphasis on dimensions (b), (e) and (f) listed above.

One other way of looking at learning problems at university or tertiary level is to analyse modes of learning, viz, lectures, tutorials, written assignments, laboratory work and fieldwork. Somewhat related to modes of learning are modes of assessment, viz, objective tests, essay-type tests, graduation exercises, etc.

All these lead us to the last of the three positions that I said must first be clarified before we proceed to attempt to suggest some relationships between student characteristics and learning problems. This factor has to do with indicator or indicators of learning problems. The question is how do we measure learning problems? Do we go by examination results and conclude that those with first class or second class upper honours degrees, have the least learning problems and those with third class or general degrees have the most learning problems?

My own stand is that examination results are the least valid indicator of the presence or absence of learning problems. The examination results merely measure the learning outcome in a limited way. They do not measure the learning process. And the limited learning outcome as measured by examination results cannot be considered synonymous with learning process during which time the majority of learners are faced with all sorts of learning problems in a variety of ways.

I have just said that examination results measure learning outcome only in a very limited way. They certainly do not measure students' independent and thorough search for knowledge, students' active participation in their learning interaction with their teachers, students' creative and critical thinking, and students' intellectual discipline and honesty. They merely measure students' mastery of facts and formulae, and the application of these facts and formulae for the solution of problems put before them, during examination time.

Therefore, any attempt at establishing relationship between student characteristics and examination grades or class of degrees (for instance, a study by Sivalingam[1] on the relationship between personality, social factors and academic performance of Malaysian university students) is futile in the present context of our discussion in that it is inappropriate and inadequate to answer the problem posed. A more appropriate way of doing it, in my opinion, is to be independent of examination results and to resort, to specific learning problems, once such problems have been identified. Our earlier discussion on dimensions of university learning, modes of learning and modes of assessment should be of some use to us in identifying some of the learning problems.

Given that the present discussion is exploratory in nature, I do not propose to be exhaustive in my listing of the instances of learning problems at the university. It should suffice for our purpose, to merely focus our discussion on some examples of such learning problems.

Some instances of learning problems may be presented — not necessarily in their order of importance — as follows:

A) **Dependency**
1. Highly dependent on lecture notes.
2. Highly dependent on prescribed texts.
3. Highly dependent on co-operative study group.
4. Highly dependent on previous years' examination questions.

B) **Study Inadequacy**
1. Taking down notes from lectures almost verbatim.
2. Inability to resolve conflicting views that normally result from consulting too many references.
3. Inability to remember all facts. Inability to memorise formulae.
4. Inability to apply appropriate facts or formulae to given problems.
5. Being passive due to inadequate mastery of the language.

[1]G. Sivalingam, "A Note on the Relationship between Personality, Social Factors and Academic Performance of Malaysian University Students", *Jernal Pendidikan* (Journal of Educational Research), Volume VI, Oct., 1976, pp.53-55.

C) **Conflict of Values**

1. Too shy to speak
2. Value conflict: honest presentation of one's thought vs. prospect of being branded rude when contradicting the view of the authority figure.
3. Intellectual insecurity — fear of revealing one's weakness or stupidity through one's active participation.
4. Inability to be critical and creative because of one's prior training that resulted in intellectual conformity.
5. Unwillingness to deviate from what is perceived to be normative thinking for fear of the risk of losing marks.

D) **Health**

1. Inability to maximise study efforts due to lack of stamina. Not enough good food to sustain energy to study.
2. Psychological insecurity as examinations come nearer.

At the beginning of this discussion, I have listed a number of student characteristics. I propose to continue with the discusson using those student characteristics as independent variables. An additional clarification is in order at this juncture. Although I will use one characteristic at a time, it is not intended to imply that the relationship is a direct one. The effects of intervening variables are assumed throughout the discussion although these will not be demonstrated.

Let us begin with sex. Is there any relationship between sex and learning problems? If at all, I think, the relationship is a weak one. The bulk of the boys and girls would be similar in their learning process and learning outcome, but of those that form an exception to the rule, the greater number of boys and the greater number of girls happen to fall under opposing directions of extremity. The general impression is that girls are better when it comes to mastering facts, and producing neat written assignments, whereas, the boys seem to monopolize in discussions or tutorials displaying tendency to be argumentative but show less concern for neat work and are bad at mastering details. That is as far as I dare go. Beyond that would be treading on dangerous grounds.

The second independent variable on our list is demographic origin. This variable is not clear-cut, nor simple. The effect of the demographic origin may be due to other factors as well, because the urban-rural dichotomy correlates rather well with the distribution of some features (e.g.), good schools vs. poor schools; experienced and better qualified teachers vs. inexperienced and less well-qualified teachers; better-motivated and better-exposed pupils vs. ill-motivated pupils with limited exposure to challenging learning environments.

The impression one gets is that students brought up and educated largely in the rural areas suffer a lot more from adjustment problems when placed in an almost completely new and different learning environment, relative to their counterparts who grew and received education in big towns with good schools and abundantly good learning facilities. To the latter, the adjustment problems are minimal and the transition from schools to universities is a smooth one. They have been used to consulting references on their own in large school libraries.

At least at the initial stages, students from the rural areas experience much more bewilderment out of the colossal world of references in the university library, the impersonalised student-lecturer relationship in huge lecture theatres and in content-centered, no-nonsense atmosphere in tutorial sessions. Moreover, *crowds* of students that attend lectures and go to the library do so *alone*!

In terms of adequacy of study skills, there seems to exist a gap between these students and those coming from good schools in big towns.

One other feature of typically rural students is that some of them are relatively of poor origin. Some of them may not get hostel accommodation, while others may prefer to live outside the campus in order to live much more cheaply. Owing to malnutrition in their childhood and their present condition of living, they lack energy to persevere in their studies. Beyond a certain level of concentration, their mind begins to tire easily.

The next variable is age. Although a minority, the 'adult' student population on our campuses is growing in number, they have been working before, and some of them are married and have children. They brought with them problems, such as, the unsettled problem of their own leave of absence with or without pay, the unsettled problem of transfer of spouse to some place near the campus, the problem of having to go home every weekend or once fortnightly to attend to family needs, etc.

Psychologically, their adjustment problem is one of adapting to a new environment where they have to learn amongst students who are young, fresh, energetic and sometimes more capable. At their age, their memory power may be less efficient. This is made worse by the fact that their attention to study has to compete with their attention to their family.

One slight advantage that adult students have over those fresh from schools is their experience and maturity, making it easier for them to see the applications of principles or theories to real life situations.

It is quite a common practice among adult students in universities to group among themselves and organise study sessions where discussions and exchanges of notes take place in their efforts to complement lectures. This may be their collective solution to their sense of inadequacy. One negative effect of this is that they become dependent on group division of labour and collective effort which discourage members from individual efforts toward independent and thorough search for references in pursuit of truth.

Another characteristic of university students is that some of them came from English-medium schools, while some others came from Malay-medium schools. This distinction, incidentally, will disappear in a few years' time; but for the time being it exists. The English and the Malay-medium students are equally capable. Some Malay-medium students have done well relative to their English-medium friends, but of course there are other variables that have come into play.

However, while the medium of instruction as such has no bearing on the capability of students, some of the Malay-medium schools might have placed some constraints on their students' early study and preparation. For one thing, there is a tendency for these students to be dependent upon a very limited number of references.

Overlapping, to a certain degree, with the rural-urban characteristic of university students is ethnic origin. At the moment we have a very high percentage of Malay-medium students being Malays. Students of other ethnic origin would represent only a small fraction that came from the Malay-medium schools. Just as the language medium does not show correlations with intelligence and capabilities, the ethnic origin, too, does not show correlations with intelligence and capabilities. Faculties like medicine, dentistry, economics, and law, to quote only some, have now clearly shown how unfounded and baseless was a belief among some in the past that academic achievement correlates with students' ethnic origin.

However, the bulk of Malay students came from the rural areas. One effect this has on their studies is that they are faced with some kind of value conflicts. This is manifested in their learning habits, such as, an unwillingness to contradict their lecturers, an unwillingness to deviate from the majority opinions, unprepared to consult too many references for fear of conflicting views, being reserved or not-participating in discussions unless asked to participate, etc.[2]

The Malay and non-Malay students coming from the English-medium schools do not differ so much in their expression in English. Another picture emerges, however, when we compare the Malays from Malay-medium schools and the Non-Malays from English-medium schools in their writing in Bahasa Malaysia. The non-Malays writing in Malay is largely grammatical and structural, whereas the problem with the Malay-medium Malay students writing in Malay is largely precision. This, in my opinion, is due to two factors, firstly, the Malay students have too much freedom of choice of variants to use — Malay being their mother tongue, and secondly, the schools in their teaching of Malay lay greater emphasis on being grammatically correct but not so much on precision, correctness of facts and effectiveness of expressions.

Now let us go into the kind of learning problems of students by faculties or disciplines. I do not think there is any learning problem peculiar only to a specific faculty or discipline. What we do observe is that faculties differ in their teaching orientation which is largely due to the orientation of the disciplines they represent. The arts and humanities would be dealing with general principles, historical trends, philosophical thoughts, etc., most of which are, by and large, qualitative and less subject to rigid quantitative testing. By way of a footnote, subjects within humanities that have approached rigid testing have a tendency to divorce themselves away and call themselves social sciences instead. One kind of training students get from arts and humanities would be in extensive use of references, and in seeing social phenomena from varied standpoints. The same cannot be said, I think, of the natural sciences or exact sciences.

So long as we use examination results as a criterion, students in both faculties would show more or less similar distribution curves, resulting in an impression that if there should be some learning problems, then, the problems are similar to both groups of students. As I have tried to show at the beginning of this paper, there are other dimensions of university learning that are not

[2]See S.M. Ponniah, *Guidance, Counselling and Student personnel Services at MIT*, MIT Publications Series, 1972, p. 22.

subject to examinations and testing. Looking at the problem from the standpoint of these other dimensions we see the following:

a) Both groups of students do not think alike. They develop ways of looking at things in biased ways consistent with the frames of reference peculiar to their respective disciplines.

b) At the level below the university, the streaming into arts and science begins about four years earlier. By the time students reach the university, their minds have already been framed by their disciplines' respective intellectual paradigms. This state of affairs acts as a barrier to greater students' freedom of choice or selection of sujects across disciplines or across faculties at least during their first year of study.

c) A somewhat similar problem repeats itself when it comes to graduate studies. Some courses at postgraduate level take in students from various disciplines. Diploma in Education and Master of Education programs are cases in point. Arts or humanities graduates and those from the sciences have their own respective academic peculiarities due to the same reason, given earlier. The arts students will find it more comfortable studying non-quantitative aspects of educational psychology or sociology of education. The science students, on the other hand, will find it more comfortable to study psychological testing and measurements, educational statistics, etc.

d) One other problem arising out of all these is that students in different disciplines develop a sense of importance of their respective subjects to the extent that they shut off the door to knowledge from other disciplines. Hence, the overriding objective of seeking knowledge and pursuing truth becomes defeated.

Now, let us turn to students with emotional problems. Their problems are of many kinds. Some of these may be listed as follows:

a) Problems arising out of broken love-affairs or an unhappy state of famly affairs.

b) Problems arising out of addiction to drugs.

c) Problems arising out of religious beliefs.

d) Problems of tension due to a sense of inadequate preparation for examination.

e) Problems arising out of financial difficulties.

f) Problems arising out of perceived discrimination exercised by lecturers against them.

The first and second problems, namely, those arising from broken love-affairs or an unhappy state of family affairs are usually associated with the young. Counselling services at universities may be of help to these students if only they are willing to come forward and "open up". The third problem, namely, that which is due to misconceived religious belief is essentially the problem of Malay students involved in certain groups of the "dakwah" movement. The more extreme type of the followers of the "dakwah" movement may choose not to study certain subjects that are construed as

against the teaching of Islam. Other religions with their own peculiarities may also create problems. For example, students who are followers of the Seventh Day Adventist Sect may refrain from studying or attending class on Saturdays.

The fourth problem, namely, tension due to inadequate preparation in the face of approaching examinations, is normally associated with those students who are too involved in organisational work for extra-curricular activities. In recent past, some students become heavily emotionally involved in some political actions leading to demonstrations. It took quite a while after the event before they could detach themselves from the emotional involvement. Owing to this involvement they found it hard to concentrate on their study. They then became panicky at the prospect of not doing well in their forthcoming examinations. The same problem, incidentally, is also associated with students who study hard but who lack study skills. They have taken too much notes from lectures, but having to read these notes taken verbatim creates a panicky state in their minds which further hampers their study.

The fifth problem, namely, problem arising out of financial difficulties is usually the problem of non-scholarship holders coming from poor families or elderly students who have to resign from their job or come to university on no-pay leave. The source of their problem is their financial worry which results in an unsettled mind and the inability to concentrate on lectures or tutorials. Some have to absent themselves quite often in order to solve their financial problems every now and then.

The sixth problem, namely, that which is brought about by perceived discrimination exercised by some lecturers is, by and large, a problem of the Malay students. This is indeed a very difficult problem to handle. The same remark uttered by a Malay and a non-Malay lecturer conveys different connotations to the students. When uttered by a Malay lecturer it is taken to be well-meant, but when uttered by a non-Malay lecturer, it creates doubt in the minds of the students as to whether or not there is an ulterior motive. The students' worry becomes exaggerated sometimes to the extent that they have to run to some Malay lecturers to get assurances. This situation naturally affects their studies adversely.

When attended by a sense of insecurity, a well-meaning remark by the non-Malay lecturer may be taken by the Malay students to mean as a threat, whereas a neutral behaviour of the same lecturer may be construed as a sign of disinterestedness influenced by racial prejudices.

The last of the independent variables is the students' state of physical handicap. This problem is quite well known to all teachers at institutions of higher learning. It must be pointed out though that only a handful of the physically-handicapped are studying at our institutions of higher learning. Among them, the most seriously handicapped are the blind. These blind students have undergone special training from an early age. When they finally reached the university, their motivation to study was beyond questioning. The problems faced by them are, among other things,the special equipment that are needed are as yet still unavailable in some institutions, and secondly, the reluctance of the institutions to cater for this type of students knowing fully well that the great majority of the teaching staff are not trained or equipped to handle this special situation.

There are other students that suffer from some other types of physical handicap. Some suffered from the physical handicap before they were admitted into universities. Some became physically handicapped after they have already been admitted to the universities.

The general observation that can be made is that institutions of higher learning do not make any special provisions for the physically handicapped in order to assist them in their learning and living at universities. These students have to make do with whatever facilities there are that are designed for the non-physically-handicapped students.

Ladies and gentlemen,

Those are some of the relationships between student characteristics and their learning problems. Let me reiterate that these observations are casual and non-empirical, and, therefore, should be viewed with extreme caution. However, despite the shortcomings, I hope they should be able to serve as a basis for your further deliberations.

Thank you.

4

CHARACTERISTICS OF UNIVERSITY STUDENTS AND THEIR LEARNING PROBLEMS: AN INDONESIAN CASE

by
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Abstract:

This paper tries to describe some prevalent characteristics of Indonesian students and in a modest way relates them to several crucial learning problems.

Therefore, it does not attempt to make an accurate in depth academic analysis.

The paper relies on several independent studies regarding the problems concerned, however, these studies are designed to answer their own set objectives which differ from the objectives of this paper. Due to this, the paper has several implicit limitations when it comes to the question of whether the characteristics identified directly influence students learning problem. As the data are limited, it is possible only to postulate a number of possible relationships. The paper tends to stress again the importance of students' background as a source for understanding their learning problems. A better learning system based on a deeper understanding of students' backgrounds may make the teaching learning process beneficial and productive for all parties concerned with higher education.

Finally the paper has found that the idea of preparing future leaders of a country through higher education is acknowledged not only by students but also by those who have invested in their education.

There is a strong indication of a gap between students' aspirations, concepts and their concern for participation in social reform on one side, and their motivation for study on the other.

The Changing Profile Of A New Priviledged Group

The independence of many developing countries after a long period of colonization has brought new aspirations for the nation's future. Linked with this idealism was a determination to *invest* and *encourage* the development of mass-education.

Inherent in such nationalism is the desire to rapidly get rid of their subordinate place in the international economy as producers of raw materials and markets for other nations' finished products.

This of course is a reflection of a two-fold goal viz. for increased internal well-being of their people and external independence in the social, cultural, political as well as economic-fields. (cf. Soedjatmoko, 1977: 536).

The university's teaching role must support these goals. The general community has responded very positively to this idealism as reflected in the increasing enrolment in higher education.

As Murray Thomas (1973: 258) was able to show the total enrolment of Indonesian students in the 1960's increased more than 460 percent over the estimated 60,000 students attending colleges in 1959.

Indonesia's policy of enlarging the absorptive capacity of schools and Universities in the next 5 year development plan is one sign of the increasing demand for higher education.

The point which I want to stress is that since independence and more particularly in the future, greater opportunities have and must be provided for education. Even now enrolment in Higher Education has increased in spectacular numbers.

Students in higher education will bring with them a wide variety of social, cultural and economic backgrounds.

In contrast to Indonesian University students of the 1950's, the 1960's generation, are no longer children of a small group of aristocratic or beaucratic families. Through scholarships and other means of Government and private support, land-less peasants children and other village youth will have the same opportunity as sons and daughters of urban and western oriented or business families. One of the most important groups to enter University as noted by Magenda (1978: 10), are students with Islamic backgrounds who were not represented in the colonial period and were rarely represented in the period of the 1950's.

This diversity in economic and sosial background will continue to characterise the profile and more importantly influence the learning problems of Indonesian students.

Some Prevalent Characteristics

Background data.

Between the years of 1975 and 1978, Serlito (1979) and his colleagues have undertaken several studies on Indonesian students. Their findings on students' background are as follows. The average Indonesian student is 23.6 years of age and falls within the age range of 17 to 32.

Of the total population studied (2050 respondents), 75.66% were male and 24.34% female. According to ethnic origin it is found that 27% are from Java, 12% from North Sumatera, the remainder being a combination of other ethnic groups.

The majority of 65%, are of the Islam faith. The majority of Indonesian students have been brought-up by their own parents (90%) and 50% of this category of students are supported by their families.

It is interesting to note that these students have between 7 to 15 brothers and sisters and 22% had, before entering university lived with relatives. This is an indication that the average Indonesian student has not been confined within nuclear family but instead has had extensive experience within the extended family system.

Moreover, the data show that more than 50% of students have come from middle class families; 30% from the lower class and only 0.37% are sons and daughters of high officials in Indonesia. However, the absence of a definition of middle and lower class families on the other hand, limits the value of this data. It would be interesting to know the distribution according to individual universities to obtain more specific data on the social economic background of Indonesian students.

The general trend with regard to the marked increased in students and the fact that these students are no longer confined to a group of young people from the aristocratic or beaurocratic families remains significant as observed by Magenda (1978) and Thomas (1973).

The institutional study of one particular university supports this point. In that study 65% of students come from high schools in small towns, 10% from schools in middle sized towns, and 25% from big cities (Satya Wacana Institutional Research, 1978: 20).

The relevance of such information becomes clearer when we realise that parents employed in industry or in other limited prestigious Government and Private positions are bound to be residents of big cities while the normal "middle class" workers are usually found in middle sized and small towns.

If these generalizations are accurate then this generation of Indonesian students reflect a new social mobility within the society.

Parents aspirations regarding the benefits of investment in education may, therefore, be related to expectations of improvements in their own social status and prestige.

Self — concept and role expectations

No single answer to this aspect has been revealed in Sarlito's study (1979). Students mentioned 3 types of roles, viz:

a) that students should be the prime force for modernization. This implied an active in achieving and creative role as students and not merely carrying on an inherited leadership function.

b) that students acknowledge the fact of becoming the *privileged* group for the nature of studying in the University is to prepare them to be the future leaders of the country;

c) that the majority of students (Soejono Soekanto, 1979) think of themselves as an integral part of the society at large and that their role in modernizing the country should be performed together with and not separately from the rest of society. In the light of students' expectations about their roles it is clear that they revealed two important characteristics i.e. achievement motivation and social solidarity.

Would their *future perspectives, learning style* and *motivation* give weight to these above mentioned characteristics merits our attention.

Sarlito (1979) utilized 3 different categories to indicate students' perspectives on social and political affairs viz. very active, active and non-active. The proportion of students within each category is 2.78% very active, 5.17% active and a large majority (92.5%) are non-active.

The last majority stated that they are interested only in campus activities which consist of studying and sports or cultural and artistic activities. It must be noted, that Sarlito's study was undertaken after the period of student protest and unrest, so that the significance of mass student participation in political demonstrations in 1966 and 1974, is not included. What does such a phenomenon mean in the light of students self concept and role expectations?

Is it a new strategy which is consistent with their achievement motivation, i.e. to better prepare themselves for future leadership and responsibilities as a form of expression of social solidarity? Sarlito's study found no evidence to support the proposition that students are strongly motivated to complete their studies as soon as possible. This is especially true of student leaders (activist). The latter group of students gave as their reasons that by being activists

they had intentionally chosen prolonged study to enable them to obtain experience in leadership in the community which is crucial for their future responsibilities. This same group of students are quite sure of their capacity to complete their studies — which they see as a matter of time only.

In constrast, those who have stated their interest in studying only are not quite sure of their capabilities and some have even shown uncertainties about whether they will graduate at all. Here, according to Sarlito, is an indication of the students' lack of confidence. This is strengthened by the fact that students themselves have stated when asked about their academic performance that most regard themselves as of only average ability.

Although I realize the risk of making an academic error, I can hardly resist the attempt to relate the above mentioned situation to the general trend of low productivity in Indonesian Universities.

In the study of the Directorate General of Higher Education (1976: 75—76), the average productivity rate was low to be only 4.9% for the years preceeding 1975. This is an average covering all schools from the highest (Medical Schools — 8.5%) the lowest (Education — 3.3%). This percentage is the result of utilizing the ratio between total student enrolments and graduates in any one year.

When the total graduate per year is compared to those enrolled in their final year of study the productivity rate is highest for medical students (50.6%) and lowest for education (31.2%) with an average of 32.0% for all fields of studies.

But if we compare the total number of students in their final year to total enrolments, the study shows the highest results (26.9%) for agriculture and lowest (10.2%) for technical faculties with an average of 18.5% for all fields of study.

As pointed out earlier, students learning motivation cannot be singled out as the sole reason for the low productivity rate. There are many other factors which have a combined effect on this result. Involvement of Teaching staff in teaching, research and community service activities for one, might have contributed to such a situation.

The same study of the Directorate General of Higher Education gave the following information. (See Table 1: Staff Utilization of Time in State Universities[1])

TABLE I: STAFF UTILIZATION OF TIME IN STATE UNIVERSITIES[1]

University Category	Teaching %	Research %	Community Service %	Total %
A	2.52	5.41	9.65	17.58
B	2.68	3.64	8.22	14.54
C	7.61	4.02	19.40	31.04

Source: Directorate General of Higher Education (1976: 88).

[1]See Appendix I for geographical distribution of the categories. It is related to very advanced Universities (A), Advanced (B) and Ordinary (C).

There is a common feature in time utilization in all Universities that the highest proportion is dedicated to public service compared to teaching and research. This is particularly high for Category C universities the majority of which are located outside of Java.

It was revealed also that staff of the behavioural sciences and law faculties utilize 35.71% and 37.46% of their time respectively for public service while those in technology dedicate 11. 65% (highest) of their time to teaching and the highest for research was found to be in economics (11.34%)

The general trend was that University staff of all categories utilize only 14.54% to 31.04% of their total 40 hours per week required FTE (Full Time Teaching Equivalent).

It would be very important to note that student motivation as described earlier, on one side, and under utilization of staff resources for academic activities, on the other, as having some effect on the productivity rate of the teaching learning process.

The student themselves in Sarlito's study expressed their dissatisfactions with regard to their learning environment. Students in general are not yet satisfied with the course (curriculum) and the way it is presented to them by the teaching staff. Again this might partly point to basic methodological weaknesses on the part of the teaching staff.

A final note on this section of the teaching-learning process which might have important implications for designing learning systems is the style of learning of students. Study in grous seems to be favoured by students compared to individual effort. There is no description, however, of what this means. Does it for instance mean collective activities in reading, discussions, making summaries and the like.

Even so there exists contradiction between how students state their style of learning and the fact that many students do not yet utilize their leisure time effectively. With regard to this, the data show wastage.

Learning Problems of Students

Earlier studies referred to in this paper are studies of student characteristics as such. This means that the studies were not designed to analyse the correlation between prevalent characteristics and learning problems. On the other hand, extensive studies on student learning problems, as far as I am aware of are not yet in existence. Therefore, we will have to rely on utilizing the limited data available to arrive at some aspects of concern.

The Guidance Centre of my own University, during their 8 years of establishment have undertaken a variety of counselling services primarily but not exclusively for students. The center discovered that learning problems are complex and consist of many interrelated factors.

In 1971 The Center dealt with 105 different cases which were classified as related to study problems. In addition 92 cases involved personal problems, 41 financial, 13 cases related to sexual problems, 11 religious problems and 11 to health.

The Center's data for 1972 and 1973 can be presented in the following Table.

TABLE II: CASES DEALT BY THE GUIDANCE CENTER RELATED TO STUDENTS PROBLEMS AT SATYA WACANA UNIVERSITY

No.	Cases Related to:	1972	1973	Total
1	Study	119	64	183
2	Psychological	127	14	141
3	Finance	49	4	53
4	Vocational/Occupation	37	1	38
5	Sexual	2	—	2
6	Religious	10	—	10
7	Housing	6	1	7
8	Health	8	7	15
9	Personal	—	99	99
10	Choice of Departments for Study	48	—	48
11	Social Relations	—	2	2
12	Family	—	10	10
13	Academic Tests	—	24	24
14	Regular Consultation	—	23	23
15	Need for Information	43	—	43
	TOTAL	439	249	688

Source: Satya Wacana Facts & Prospects (1974: 52)

Students seeking help have increased in number over the years: The Rector report for 1978 showed that there was an increase of approximately 20% between 1977 and 1978.

It is worthwhile to compare the *problems* of students served by the Guidance Center with the characteristics of students in Sarlito's study.

Although these studies were reported independently and carried out at different periods of time, both Sarlito and the Guidance Center are confident that a great deal of weight, can be placed on *student's lack of confidence* in effecting their learning motivation and problems.

In addition their experiences of failure and frustration, their unrealistic goals for life and varying natural ability, the lack of confidence, may also be deeply rooted in their child-parent and other family relationships.

The data regarding student background described earlier pointed to characteristics which throw light on their study problems.

It is said that the majority of students come from middle and lower class families located in small and middle sized towns. This in itself will bring adjustment problems as Universities, with their "western-influenced — culture" are located in big cities with a different atmosphere from the students' home environment.

Can for instance, students' desire to study in groups be related to their experience of togetherness in the extended family system? How do they cope with the competitive system which is inherent in most Universities?

In the lights of all this it seems that to be truly productive Universities have to do more than just perform their traditional roles of teaching and research. Special attention needs to be given to varied social and cultural background of the students and their economic needs within the teaching-learning process. Teaching staff and administrators of Universities must therefore be capable of designing and bringing into effect a creative learning system.

One is impressed with the ideals of university students but the gap is still to be bridged between their stated drive to take an active part in changing the society and their low motivation for study.

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APPENDIX I.

CATEGORY OF STATE UNIVERSITIES

Category	University/Institute	Institute of Teaching & Education
A	Indonesia	Jakarta
	I.P.B. Bogor	Bandung
	I.T.B. Bandung	Yogyakarta
	Gadjah Mada	Malang
	Airlangga	
B	Sumatera Utara	Padang
	Andalas	Semarang
	Pajajaran	Surabaya
	Diponegoro	Ujung Pandang
	Brawijaya	
	I.T.S. Surabaya	
	Udayana	
	Hasanuddin	
	Syah Kuala	
C	Riau	Medan
	Jambi	Manado
	Sriwijaya	Surakarta
	Lampung	
	Jenderal Sudirman	
	Jember	
	Tanjungpura	
	Palangkaraya	
	Lambungmangkurat	
	Mulawarman	
	Sam Ratulangi	
	Pattimura	
	Mataram	
	Nusacendana	
	Cenderawasih	

5

CHARACTERISTICS OF UNIVERSITY STUDENTS AND THEIR LEARNING PROBLEMS — THE SINGAPORE CASE

by
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Abstract:

The paper traces the evolution of several characteristics of students which have an impact on learning problems at the university level. As it was felt that a mere cataloging of characteristics and problems would be dull and not provide for an explanatory model the paper is broken up into several segments. The first part of the paper describes and discusses the socio-educational milieu which provides the background against which particular characteristics are developed. The second section deals with particular characteristics. It is the thesis of this paper that some of the relevant characteristics are ascribed in nature. Some are achieved, and many prescribed. The last is accomplished through the implementation of government policies and educational programmes in schools. The interactive effects of these characteristics are not always cumulative and might even be conflicting. It is the product of these effects which produces the student-types which are in the Universities. As may be expected there are variants within these categories as well. Each of these categories face different learning problems in the University.

In third segment, we deal with types of learning problems and show more detail interactive effects of the characteristics. Not all possible characteristics are traced because of the lack of data. But sufficient findings from previous research indicate that despite differences of perspectives and problems for each type, a model of the teaching-learning situation can be developed based on cognitive development differentials and commonalities.

The last segment deals with resolutions of the problems. The major conclusion of the paper is that dealing with characteristic problems will be a piecemeal and a temporary affair. Even if we start with a homogenous group that educational process will provoke and initiate changes in the students. The interactive end-products would be problematic again in a short time. The alternative, but not necessarily easy solution is to teach the student the art of learning so that each will be his own teacher. In such a situation the teacher becomes the guide and not the source (a limited one, even in the best of times) of knowledge.

Introduction

In this paper, the topic will be discussed with major reference to the students in the University of Singapore and also those in the Joint-Campus of the University of Singapore and Nanyang University.* The basis of this discussion will be centred on a number of major characteristics which have been found, in the limited research on this topic, to be relevant to teaching-learning difficulties. Some of the research to be discussed includes work done

*The Joint-Campus involves only selected faculties and departments of the two universities. They include essentially those in the Arts and Social Science Faculty, Accountancy and Science Faculties.

on pre-University students. These are important primarily because they provide partial explanation of the characteristics which are of current importance and their impact and consequence for university education. Although, it may seem that the data base is very comprehensive, this is not so. The reason for this is that many of the studies to be quoted are specialized to sub-samples within the particular educational level they are researching in and, very often, are also limited in the theoretical issues they are interested in. Because of this, the reader is cautioned against generalizing beyond the data, and also to note that the picture drawn is based on a recreation of the reality from numerous perspectives.

The socio-educational milieu

In assessing and isolating characteristics which are significant in the Singapore context, the subjective element is very high because no study actually 'proves' or supports any one variable over another. In any case, it is not necessary to rank-order the characteristics as, empirically, there is a great deal of interaction among them. It is precisely this problem which is at the bottom of teaching-learning difficulties among the university students in Singapore.

Basically, the characteristics of each student which have a consequence for their learning capability are a product of a number of interrelated processes in Singapore. The most basic is the workings of the sub-cultural grouping in which informal education and socialization into values and expectations and various cognitive development emphasis are undergone. In Singapore this takes the form of three major ethnic groupings with religious, educational and socio-economic differentials and adaptations are also likely *within* the major groups. We cannot possibly go into these more specific sub-cultural variations, but suffice to say that they would and have produced differentials within the major ethnic groupings.

These sub-cultural variations do not alone produce the characteristic differentials which are consequential for learning capabilities. Instead they are interactive with a number of structural and programmatic variables in Singapore's educational processes. The structural variables stem from the fact that in Singapore there is streaming by linguistic and academic disciplines. The earlier period of educational development in the colonial period was rather dependent on the efforts of the sub-cultural groups. Vernacular schools and specialist schools which were sub-culturally supported were the order of the day. This earlier system has since been evolving into a more rationalized educational system. But linguistic streams still exist and create sufficient cognitive differentials among the various groupings for it to be a problem for the current bath of university students.

Secondly, the dichotomy into Arts and Science stream also creates students who are faced with different levels of learning problems. It is not that being in the Arts or Science stream is inherently problematic. Rather it is the fact that academic capability is the basis of the academic streaming procedure. Also, for various reasons and situational demands, the Chinese stream students have, if they are academically successful, tended to specialize in science stream subjects, perhaps because these subjects have lower linguistic loading. This has caused problems when a wider ranging university curriculum is the order of the day.

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Intruding into all these sub-cultural variations of preferences, capabilities and limitations are the programmatic changes to curriculum which are reactions to exigencies of social, political and economic development. In the areas of technical and vocational emphasis (even in academic subjects); of linguistic competence, and emphasis on bilingualism; of concern for moral education and national identity — we see multiple stimuli which do not necessarily act in cumulative fashion. In fact, for example, possibilities exist for conflicts of expectations in the emphasis on national development and on moral growth which have to be sorted out. The end product is thus, a not easily classified array of student-types who end up in the institutions of higher learning. It would be an exaggeration to say that there are as many student-types as there are students but, from observation and the findings of the research, there are at least a few major groups of student-types. As such any teaching programme designed for one category could cause difficulties for a large majority of others. The degree of difficulty being a function of the overlap and commonality of the cognitive map developed in similar and dissimilar socio-cultural and educational experiences of the students.

From the above the key independent variables may be expected to be those associated with the academic and linguistic streams of education and the social-cultural variables such as socio-economic status, ethnic group differentials, integration into the national development sequence and group identification at various levels from the institutional to the individual. Finally we have the various educational policy decisions, some tied in with developmental exigencies and some derived from political and social philosophies and value judgements. This milieu in broad detail, provides the socio-educational factors from which characteristic grouping of student-types emerges and in which they are expected to 'get an education'. How much each factor contributes to, or denies, the individual the opportunity of maximizing his potential is difficult to quantify, but that they have effect seems clear as will be shown in the next segment.

Characteristics — ascribed, achieved and prescribed

In this section, the major findings of the literature on educational processes in Singapore will be presented. The key concern here is to identify the interactive consequences of the various dimensions isolated in the previous section. The reader should note that these findings are to some extent dated and that current policy changes may remove a few of the problematic variables. Nevertheless, they are useful in that they sensitize us to concepts and processes which are significant in a teaching-learning model. Also, they are important, we feel, in that they identify key support factors which modulates the degree of learning motivation which characterizes each student at the university level.

As with other cultures, the most frequently studied variable in relation with education is socio-economic status (SES) — measured in the form of its various sub-dimensions. Tan (1976)* in her study of social class and academic

*Full references for this and other sources are listed at the end of this paper.

achievement suggest that higher SES students are likely to evidence greater academic achievement, but that the correlation is not a strong one. This suggests that other intervening variables have to be considered. The study isolated parental aspirations as a key variable which was significant in academic achievement irrespective of SES standing.

On the other hand, the widely held notion that home environment, in terms of physical environment, available facilities, and instructive factors, would affect studies was not found to be quite important. Tan feels that the correlation between lack of proper study facilities and low academic achievement does not necessarily tell the whole story. Noted are also the fact that high SES students also face difficult environmental problems and basically if the student so wishes, he could use alternate study areas which have been opened up by the government such as libraries and extended school facilities in the evening. The question was whether the student would be sufficiently motivated to use these facilities. In a follow-up study she found that higher achievers are more likely to use such outside facilities — and as such the students' attitude to work and learning is a more important variable than SES related variables.

These findings, suggest then, the limitations and restrictions of family background are not simple one. While a higher SES family background is related to academic achievement, it does so through the attitudinal structures it creates in the student. If the family has high expectations, it becomes part of the students cognitive map and for this reason, SES is less important than the fact that there are more attitudinally supportive parents in high SES categories! The lack of financial support is less a factor in the Singapore context because of government support of academic merit through bursaries. So what has to be realized is the mix of variables are not constant and in a one-to-one relationship. The problems in learning are not isolated to the individual but depends on the social sub-system of which he is part. In this case the family provides for the motivation but by itself it is probably an insufficient explanatory variable.

In another study by Tan and Jumabhoy (1970), an attempt was made to investigate the existence, if any, of ethnic differentials on a number of dependent variables. The study findings indicate that little or no differences existed between Malays and Chinese students on the valuation of education; on the preference of furthering education instead of leaving to work; on level education attainment hoped for. On the basis of the above, broad differences do not exist when the independent variable is ethnic group on its own.

However when the linguistic stream of education is considered, the perspective of education show differentials. English stream respondents seem to place less importance on education than Chinese and Malay stream respondents. An important note on differences here is Chinese students in Chinese and English streams. The Chinese students in the Chinese medium have a higher valuation of education than the Chinese in English medium schools.

The findings suggest that the basic sub-cultural variations in perspective about education is less important than the environment in which education is being conducted. This is clearly shown in Chinese students' valuation of education depending on stream of education. Again this is an interactive effect of the variables and is consequential for learning-motivation which we see as a significant variable in the teaching-learning model.

Another variable of interest at the pre-University level is significance of academic streaming on learning-motivation. From the beginning of Secondary education students are streamed into science, arts and vocational educational programmes. Essentially this is on the basis of academic performance in the Primary School Leaving Examination. The best students go to the science stream, followed by arts stream and then the vocational. This selective process is modified only slightly by student's choice. There is thus some status to being in arts stream and some stigma to being in vocational institutes. The impact makes itself felt on achievement motivation and on the self-concept of the students. With the consequence that a number of those in vocational schools especially are disinterested in their education. The choice having been made for them, we find that to some degree the differentials artifically set up creates problems because of a lack of fit between interest and ambition and educational programmes. The characteristics of the students are thus, in a way, prescribed rather than achieved. The cut-off point on grades achieved are arbitrary demarcations of status. A similar parallel occurs at the University level which produces again a student distribution in courses which is biased in terms of ability and interest. Its product is a consequence of an interaction of perspectives gained within the academic stream and ability differentials which produces the different student-types referred to earlier. Each type is characterized by different learning capabilities and problems as may be expected.

On a seemingly different level, Khoo (1973), in her study of academic achievement and motivation, found that with *increasing* educational level there is decreasing motivation, aspiration and perception of own ability. She saw two possible explanations for this finding. Firstly, as educational level increases, there are greater demands on the student. As not all students can meet the demands, interest declines and in turn the other dependent attitudinal variables. Secondly, as the system of assessment does permit the less able to move up the educational ladder, there will be an accumulation of what she vividly labels as 'muddlers.' — students who do not have any motivation towards academics but stay in for other reasons.

These student-types and variables are operative within the university and are pertinent to the teaching-learning problems. In the two cases of course different teaching approaches are necessary. The important point to note is that these perspectives are seen to run through both pre-University and University educational processes. The second thing to note is that they are not categories themselves but are sub-categories within the previously defined types. What is not clear is, if these variables are present at different levels in the previously defined student-types. There seems to be some foundations to assert this on the basis of the author's participant observation within the university context. However, we will leave discussion of this consequence till later.

As may be gathered then, the student characteristics pertinent to the learning problem encountered in the university are a mixture of ascribed, achieved and partially prescribed components. The first component are those related to ethnic and sex-role norms and expectation. The second related to those which the student's ability has gain him such as a highly developed cognitive map, ability to meet new situations with equanimity, etc. The last component is composed of variables inculcated through educational policies

and to a certain extent imposed on the students. The first two components provide for variability of student-types but the last to a large extent restricts and limits the variations and provide for commonalities. To a large extent the programmatic variables of the educational policies have been focussed towards this end. This prescriptive element has both pluses and minuses associated with it as may be seen in the next section.

Learning problems among university students

As a result of the cognitive maps developed earlier by the students, we find a number of behavioural consequences being evidenced by the various student-types.

Perhaps the variability of the learning-problem situations among the students may best be demonstrated by the extremes of example and perhaps by paradox. Students can and do avoid learning problems: an almost classical example of avoidance of punitive situations is seen in students taking only so called 'easy subjects and/or familiar ones preferably. For example, a tendency by Chinese stream students to take Chinese studies and Malay students to do Malay studies as one of their subject components. On similarly, for a student to take subject with low language loading, e.g. Mathematics, Statistics if the command of English or Chinese is bad. On the other hand, the 'easy subjects for those proficient in languages may be those subjects with lots of reading material; essay and oral requirements and ability to manipulate linguistic concepts. Thus for all student-types there would normally be some subject combination which would be 'easy' for them and these would be chosen by those not so highly motivated or with low self-concept from a learning stand point. As a result 'learning' problems never arise. Although this is not to say that what is 'learnt' is necessarily more useful to the student than what he has avoided learning.

In between this category and those who breeze through any course they join are the majority who have problems related to particular variables of experience and ability. Their problems are partially seen in a study conducted by Economic Research Centre and the University of Singapore on problems of Joint-Campus students (Economic Research Centre, 1978). The survey found that there were distinct areas of problems faced by different groups of students. English stream students were less likely to have problems with lectures, reading assignments and tutorials than Chinese stream students. Linguistic command was the important variable rather than subject matter for these students. Besides difficulties reported in understanding there is also a differential evidenced in terms of participation in tutorials.

The Joint-Campus of Nanyang and Singapore University was set up to solve the problems of the linguistic factor in employment opportunity to facilitate the transition of Nanyang to English medium institution. In a sense what we are seeing in the experience of the Chinese medium students are perhaps a temporary phenomena. Nevertheless these students are facing difficulties now and the reasons for it are several. Linguistic limitation not only produces initial difficulties with studies but it also affects the social groupings into which the students can be integrated. Many Chinese stream students have friends who are Chinese-speaking in the majority of their activities. Even exchanges of class notes and discussions are conducted in Mandarin. Learning

does not occur only with formal classes but also within informal peer group settings, etc. Thus, the Chinese stream are cut-off in both formal and informal situations from learning. In the formal setting, even basic words or concepts, not related to the course, need explanation and as a result tutorials are being slowed down tremendously because of the tutors need to stop and explain. This causes problems for the whole tutorial group as it minimises the teaching-learning time because exchange of ideas are limited.

As indicated earlier, stream of education is not the sole explanatory variable. Those in Chinese stream are also from different socio-economic background, and more likely to come from homes steeped in Chinese traditional practices and concepts. These students also have different occupational expectations and aspirations. (See Chan and Lim, 1973 and Li 1974). These differential perspectives work together with a common Chinese-stream background to set them apart from the rest of the students and also put social distance between them and the lecturers. The lack of interpersonal contact beyond formal teaching periods makes it unlikely that learning will be a two-way process.

More important than that, it provides a self-serving rationale to the student in this category to explain away his own difficulties. That is, for some the characteristics become the reason for not doing well in some cases. For others, the characteristics become the reason for the futility of doing well. This is because previous Chinese-stream graduates have had difficulties on the job or failed to impress prospective employers. As a result current graduates with similar characteristics are discriminated against. So even some able students lack motivation because they are labelled by the characteristics rather than restricted by them.

However, within the various faculties there are differentials of learning problems among the Chinese stream students. For example Science stream students from a Chinese-stream background have less reported difficulties than those in the Arts and Social Science according to the Economic Research Centre's report. This is only partly due to the lower linguistic loading. The main reason for less problems may due to higher scholastic ability of students in Science subjects. This is due to earlier streaming in Secondary education where brightest of all linguistic streams are selected for the Science-stream. Similarly Chinese-stream students registered as Singapore University student also have less problems than Chinese-stream students from Nanyang University. The reason is the more competitive selection of students for Singapore University means as a whole these Chinese-stream students are still academically more capable. This capability may be an important edge in overcoming the linguistic problems to learning. It may also be because the academically more capable Chinese-stream students are linguistically more able. This is the interactive effect between variables that might be important to consider in trying to understand the teaching-learning process.

The Chinese-stream students (or any other student-type) are not a homogenous grouping and do not all face a similar educational environment. It is thus difficult and unwise to plan on that basis. So while characteristics of the students do have an impact on learning capabilities, we find that the mixes of these variables are too complex for a simple attack on the problem.

Learning Problems — Resolutions and Limitations

What is at the bottom of learning problems may be the different cognitive frames of references with which each student reacts to the world. To a large extent these are developed within sub-cultural groupings and they have influence far beyond the educational processes. The characteristics may be different but the ultimate question is — does it aid or restrict further cognitive development. This is the key characteristic to which all the others are contributory elements. If the cognitive map is to be easily expandable, then the means of adding new cognitive bits must be available. Since language is mediative in this process the requirement for a common language is obvious. Less obvious is the need for commonalities of experience which would develop a common cognitive map between teacher and student and between fellow students so that a common base for teaching-learning is available.

But it must be recognised that differences of ability do exist beyond those that socialization variables create. It is true that some differences of academic performance may be traced to unequal social-cultural support in the formative periods of cognitive development but not all the variance is explained in this manner. Assuming that differences of ability exist, however derived, we can and should expect that teaching or learning will change the students' characteristics sooner or later. So no matter what we plan for in terms of current characteristics we must also anticipate and plan for changes in the student. The problem is the variability of the change possible. So ultimately it would have to be a very flexible programme to cater for this variance. So flexible that it may not justify our using the term-programme.

Since it may not be possible to cater to each student programmatically, another way out may be to develop in each student a capability at evolving his own learning programme. This is probably easier said than done. It assumes first of all that there is a learning model and secondly, that we can transfer it to the student. Both assumptions have been exercising the educationists' imaginations for as long as we have had human society and sometimes it seems that there are as many theoretical models as there are educationists. In such a situation, it may be better to identify factors and processes which facilitate learning rather then attempt grandoise theory construction.

The first important step in this facilitating processes is probably to point out to the student that an 'education' is not only that which is learnt i.e. content but also the knowledge and understanding of how it is learnt. In this way, content may be forgotten, but it can always be recovered by applying oneself to learning. The second step is probably the need to understand that "subjects" are not, as Sayers (1979) writes, divided by watertight bulkheads from all other "subjects", and that there are connections between spheres of knowledge. Otherwise we may be faced with a situation that "although we often succeed in teaching our pupils "subjects" we fail lamentably on the whole in teaching them how to think: they learn everything except the art of learning."

Conclusion

Although the characteristics are indeed related to learning problems as suggested by the title of this sub-theme of the seminar, the solution may not be in shaping or changing characteristics of university students. To do this may

require social change on a scale that is not imaginable nor possible. The characteristics develop out of the socio-educational milieu and impacts on the students in ways which are not always beneficial to the student or to society. If we are to cut through this we must differentiate between the content learnt and the learning process itself.

If we can impart a capability to learn, the subject matter is irrelevant to the success of the student. The question then becomes what these learning model might be.

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CHARACTERISTICS OF UNIVERSITY STUDENTS AND THEIR LEARNING PROBLEMS

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Brief Historical Background of Tertiary Education in the Philippines

The early Spanish navigators who came to the archipelago found groups of brown-skinned people who had their own systems of written communication (Osias, 1917). At least five alphabets were identified: Tagalog, Ilocano, Pangasinan, Pampanggo and Visayan. These were found written on bamboo tubes and banana leaves. Because of the fragile nature of the materials, precious few evidences have survived. While there must have been some system for the transmission of such knowledge and skill from one generation to the next, such information has long since perished.

The search into the beginnings of a formal educational system in the recorded history of the Philippines leads one to the early years of the 17th century, and, interestingly enough, reveals the beginnings to be "superior" or tertiary education in the hands of the Jesuit and the Dominican orders (Roces *et al*). In the first century of the Spanish regime, education of the young, particularly of the young native, seems to have stopped with the learning of prayers. The first school ever established, the College of Manila by the Jesuits in 1595, catered to the needs of the Spaniards. The courses at the College of Manila consisted of five years of grammar, a two years arts course leading to the degree of bachelor of arts, and a four year theology course leading to the degree in licentiate in theology. Not long afterwards, in 1611, the Dominican order founded the University of Santo Tomas. Ecclesiastically oriented in its early years, the institution granted academic degrees in arts, philosophy and theology. Later the faculties of canon and civil laws were created, and then those of medicine and pharmacy. Both institutions attended to the needs of Church and State until 1769 when the College of Manila was closed with the expulsion of the Society of Jesus from all Spanish dominions. The University of Sto. Tomas continued serving the Philippine public so that today it enjoys the reputation of being the oldest institution of higher learning in the country.

By the middle of the 19th century the necessity of formal education had been widely accepted in Europe and America. A royal decree issued in 1863 placed the educational system in the country in the charge of the Governor of the Philippines (Jernegan, 1912). The State was to be assisted by the Church in the establishment and maintenance of schools in the towns. This venture, however, did not prove successful due to the widening rift between Church and State.

With the coming of the Americans early in the 1900's the foundation of the current public educational system was laid. The first institution of higher learning under this system was the Philippine Normal School established in 1903 in response to the need for teachers to teach under the new dispensation. The University of the Philippines was founded in 1908, five years later.

The Current Situation

From such beginnings, Spanish and American, the Philippine educational system has expanded in both the public and the private sectors so that as of 1978, there were 997 institutions offering tertiary level programmes to some 980,000 students. Of this number, 237 are purely vocational and technical institutions.

In the Philippine society, as in other open societies, education is regarded as the medium for individual betterment. College education which used to be considered the private preserve of the privileged few is now viewed as the golden stairway to better living by an increasingly greater segment of the population. It is not unusual for Filipino parents to say feelingly to their children that the only legacy they can give them is a good name and a good education.

These days, among families with comfortable means, the matter of college education may be almost taken for granted. It is a natural step after high school. Higher education is a must; it is continuing preparation for adult life. The problem to be faced is not whether or not to go to college but what course to pursue, which college/university to go to. Family tradition and expectations function as potent determinants in the final choice.

For families where the cost of higher education gives pause to the project, where priority of needs has to be carefully looked into, the decision for college education may still be upheld if the young person is viewed as possessing potential for the academic endeavour and the professions. Indeed he may be looked upon as the agent for change in the family fortunes. It is not unusual for the eldest child to be told to undertake a program of studies that would lead to a steady job so that he in turn may help with the education of the younger siblings. Who had not heard of parents selling some carabaos or mortgaging a piece of land to pay for tuition fees of their children?

Testimony to the Filipino's high valuation of the college degree is the phenomenal growth of college and universities all over the country within the past two and a half decades. In 1950, the Bureau of Census reported only one state university, the University of the Philippines, and fifteen state colleges. According to the 1963 Census, aside from the University of the Philippines, there were three other state universities and seventeen state colleges. Thirteen years later, the 1977 Census reported 8 state universities and 36 state colleges. In the private sector, in 1950, there were 14 universities and 304 colleges; as of 1963, 25 universities and 400 colleges. The latest available report, the 1977 Census, has the tally at 38 private universities and 634 private colleges.

Possibly the major reason for the increase in tertiary enrolment is the all too steady increase in the total population. The current population control drive is not yet felt in the schools, much less in the tertiary level. While there are no hard data to hold on to, one can hazard the observation that the increase is also partly due to an increase in the number of students who are

seeing themselves through college. In universities in downtown Manila, the large enrolment figures in the late afternoon and evening classes are made up of self-supporting students who work in the business and industrial firms in the area.

While there is a concentration of institutions in the Metro-Manila area, all the other thirteen regions of the country are now provided with institutions of higher learning. This is in line with the government's effort to make education available to those in the less urban areas of the country.

However, early in the 70's, because of concern over the increasing proportion of educated unemployed and underemployed, the government decreed the institution of the National College Entrance Examination (commonly referred to as the NCEE) to monitor "the admission of students from secondary to post-secondary institutions of learning.....to help maintain a viable balance of all types of workers on the manpower stock of the country." This is a scholastic aptitude test administered by the National Educational Testing Center, an office of the Ministry of Education and Culture. In conjunction with this effort, a closer supervision of the more than 700 existing institutions relative to the achievement of the nation's development goals appears to be in order.

The University of the Philippines

The University of the Philippines is viewed by many as the premier state institution in the country. From its modest beginnings in Padre Faura, Manila in 1908, it is now a wide-spread system of 46 colleges, schools and institutes, with the main campus located in Diliman, Quezon City and with units in Manila, Los Bados, Baguio, Iloilo, Cebu, Tacloban, Los Angeles and Davao. There are academic programs in 156 fields of concentration leading to bachelor's degrees, 295 areas of specialization leading to Master's degrees and 83 leading to doctoral degrees.

Because its limited facilities cannot absorb the number of applicants knocking at its door (e.g., some 20,000 young men and women applied for the 5,000 freshmen slots in 1978), the University, through the years, has had to develop its own admission procedures. In addition to qualifying on the NCEE, the applicant has to qualify on the UP College Admission Test. This, like the NCEE, is a scholastic aptitude test, but it is necessarily more discriminating. The actual score on the examination is combined with the grade point average of the first three years of the secondary school record. This combined score is translated into a predicted university grade point average; cut-off scores vary slightly from campus to campus.

For the academic year 1977-78, undergraduate enrolment figures for the entire UP System rose to 24,000 as compared to the 1975-76 enrolment of 19,400. Such increase is reflective of the UP stance of opening its doors wider because of a heightened awareness of its role to help strengthen the capabilities of the society to realize its aspirations and to "take a fair share of the burden of higher education" in a growing population. This increase is also the beginning of a UP commitment to make UP education more accessible to the various socio-economic groups in the country. This concern about the

composition of the UP studentry stems from the findings of studies that have shown UP students to come from high income families who live in the urban areas and to have graduates from the best and better high schools. In as much as the University of the Philippines is supported by the people's taxes, and the great mass of the citizenry belong to the lower classes, the present administration has proposed to change, albeit gradually, the composition of students admitted into the University in such a manner as to "approximate the distribution of Filipino families among the various socio-economic groups." (*U.P. and the Future*, 3rd ed.) This modification is to be accompanied by a change in the admission system in the philosophy of teaching, a psycho-social assistance program, provisions for a scholarship program, a tuition fee subsidy structure, a grant-in-aid program and a learning assistance program.

While all the UP external units except Davao do offer undergraduate programs, it is the undergraduate studentry in the Diliman campus with which this paper will deal.

The U.P. Student

The Philippine educational ladder being what it is (entry at age seven, six years of elementary and four years of secondary schooling), the average college freshman has just stepped into his seventeenth year. Psychology tags this as the beginning of late adolescence. Developmental tasks that gained ascendance with the onset of puberty are still being worked out. The young collegiate will not have attained his full height yet. Physical growth continues but the awkwardness that is characteristics of the growth spurt will have been a thing of the past, though residual traces may still obtain in some isolated cases.

In the area of personal development, the loosening of family ties is the single most important feature of late adolescence. The Filipino family is described by anthropologists (Fox and Jocano among others) and psychiatrists and psychologists (Lapuz, 1973 and Bulatao, 1966) as closely knit, protective and authoritarian. During childhood and early adolescence there is a great deal of supervision of the activities of the young people, thus limiting experiences in self-direction. High school by and large tends to reinforce the familial atmosphere; communication flows between school and home, in the form of report cards, PTA meetings, individual parent-teacher conferences. As a matter of fact it is not unusual for a parent to tell a high school teacher, "If my child does wrong, please discipline him." In addition there is the homeroom organization. The very terminology *homeroom* indicates this to be a homebase for the student, one of his important reference points in school. The feeling of belonging is nurtured here, the voice of the individual is heard on matters of personal and social import. The homeroom adviser, more than any other teacher, serves as parent surrogate to the growing adolescent. He advises, reminds, cajoles, or even threatens the advisee into acceptable behavior. He may mediate between the advisee into coteacher; on occasion he may even mediate between the advisee and the parent.

Typically the young collegiate is a distance away from home. The University, in an attempt to have a good mix of students region-wise, has for some years now, administered its College Admission Test in centers all over

the country. So while a goodly percentage still come from the Metro-Manila area, it is safe to say that every province is represented in the student roster. The average student, therefore, is a distance from home; he finds himself more or less thrown on his own resources. There is no report card released every fourth or sixth month to appraise him or his parents of his progress or lack of it. And it would be rather unthinkable for his parent or guardian to confer with the professors in English I or Natural Science I on what the student can do to make up for a very poor showing in an examination. Nor can he go to a homeroom adviser for help in patching up a misunderstanding with a classmate. He has to order his life himself, he has to make decisions without the aid of his usual significant others. The more restrictive the supervision has been in the earlier days, the less prepared the student is to be on his own, the more overwhelmed he may be with his newly found freedom. One may point out that by the late teens the individual should have developed a fairly stable set of values to serve as his guide. This is true. But the college freshman will meet many situations for which he had no ready-made response. The University environment throbs with the pulse of academic freedom and tends to be avant garde in many aspects. If he is intelligent, flexible and enjoys a measure of self-confidence and a sense of humor, the collegiate will be able to weather through this first year with a minimum of culture shock. He will be able to take advantage of the facilities and opportunities the University offers during the rest of his academic career.

Another task that faces the late adolescent is the development of a sense of identity. As he crosses the campus, the freshman may well be mulling over such questions as: Who am I? Why am I here? What do I want to be? How do I measure up with others, intellectually? Socially? How do others see me, my professors? My classmates? What do they really think of me?

The self-image tentatively formulated through the years in the high school can suffer as the young collegiate perceives self in a totally different milieu. Only the year before he was a senior, looked up to by the lower classmen, known by the entire faculty, occupying top or near-top positions in the high school world. Now he is in college, a freshman, the bottom man in the totem pole, unknown to all but a handful of province-mates or by some co-graduates, a name on some class cards. Here he is, striving to prove to his professors and to himself that he is as good as if not better than the others in class. In the high school he found time for curricular as well as co-curricular activities. Now bibliographies are formidable, course requirements seemingly impossible of accomplishment within the given time. Does this mean that he is deteriorating? Is he really college material? If he isn't, what is he good for? The more difficult materials that the collegiate has to deal with plus the stiffer competition that he encounters can either shake his confidence in self (resulting possibly in failures) or stir him to greater efforts to affirm his identity as a University student.

Concern with adequacy is not limited to the intellectual area and to academic achievement but extends to the personal/social setting. The young collegiate cannot help but be aware of his/her sex; the late adolescent is characteristically attracted to members of the opposite sex because of heightened sex drive. The campus is a very significant environment to put one's attractiveness to test. The daily sight of mixed groups in interaction and

more importantly, of couples whose public behaviors indicate a wide spectrum of friendship and intimacy patterns cannot help but set the young collegiate to thinking, feeling and ultimately behaving in terms of his/her sexuality. The values and behaviors learned within the family and original community are often times at variance with the values of the current peer group. Such conflicts must be resolved somehow.

The collegiate is concerned with career choice. Upon entrance into the university, majority will have set their sights towards specific careers: engineering, business administration, medicine and law continue to be perennial favorites. Typicall, choice is made without sufficient information on requisite abilities and preferences and with some amount of parental intervention. As the semesters unfold, the collegiate discovers the appropriateness of the course for himself/herself. For example, one might have selected engineering because he had good marks in mathematics in the high school and a favorite uncle is an engineer. Then while he passed the first two math courses the student finds himself unable to succeed in the higher maths. He has to review and might have to revise his plans. An actual case is a student who opted for medical technology, but, upon realizing that this would keep her in a laboratory dealing with test tubes and chemicals, switched to education. She wanted to work with people. There are numerous such mis-matches.

Another characteristic of the UP student is that through the years he has been on the forefront among university studentry in terms of social awareness and involvement with issues of national concern. Periodically, as the country entered into various critical situations, the UP student has expressed himself for or against the movements and decisions of the national administration. This drive achieved its peak on the late 1960's and early 1970's, erupting into violent incidents. Martial law was declared in 1972. The campus is relatively quiet these days but the students do find ways of expressing their concern because, as one of them said, "Kung hindi tayo kikilos, sino pa?" (If we don't move, who else will?)

In short then, the University of the Philippines studentry may be described thus: He/She is intelligent, the cream culled from among thousand applicants. He/She is learning to cope with problems on his/her own. He/She is developing a sense of identity as an individual in terms of his/her intellectual self, social and sexual self. He/She is concerned about society and national issues. He/She is preparing for a career. He/She is becoming.

Learning Problems

In the last several years, admission to the Diliman campus has been very competitive indeed. When one considers that the UP freshman cohort is the top 20-25% of those who have applied for admission, one cannot help but think, "They should have no learning problems." However, the report of a guidance counsellor in the University confirms the results of a random sample of student interviews to the effect that generally student problems center on (1) academic difficulties and (2) personal/social problems, and that the latter can well affect the former.

Reasons given relative to academic difficulties can be categorized into (1) the subject matter itself, (2) the faculty and (3) self. The first, the course itself, is often given as the reason for doing poorly in Mathematics, Physical Scien-

ces and Languages. Math in particular is described as "Very hard to understand." In many instances, difficulties with mathematics stem from inherent weakness in this ability. The situation is compounded by poor preparation in the earlier educational levels. While the University does find excellence in mathematics among its engineering, math and statistics majors, there are very many more who cringe at the thought of having to take the one math course required in the General Education program. Some years ago the University had a mathematics C, a non-credit course, essentially remedial in nature. However, this has been discountinued with the reconceptualization of the mathematics courses.

Difficulty in Physical Sciences probably stems from inadequate preparation for the field. The average secondary school is generally not too well equipped for this purpose. With inadequate funds for the purchase and maintenance of equipment, teachers often find themselves making do with whatever is available. The collegiate faculty presuming on the stated objectives in secondary level science tend to take for granted that their students have entry behavior for the tertiary level.

The problem in languages is a complex one. One facet of this is the still-mandatory 12 units of Spanish. While Spain administered the country for four centuries and Spanish words are found in every dialect, the present generation does not speak nor read the language. An optional subject in many high schools, Spanish is not sufficiently attended to at that level to enable the learner to handle college Spanish with ease. However, the greater problem where language is concerned deals with the question of the language of instruction — a problem that will be discussed later.

Some students would place the blame for difficulties and failure on the faculty: "The teacher does not impart well." "The teacher is impersonal." "Cannot understand the teacher." "The teacher is a terror." "I get so nervous in class, I cannot speak up even when I have something to share." Subsequent inquiry revealed that the term "terror" covered various traits: sarcastic, strict, shouts at students, gives very low grades, and expects very long answers.

One, of course, is familiar with the psychoanalytic concept of projection. A defensive individual confronted with the effects of his wrong doing or error refuses (at the unconscious level) to see that the defect lies in him. He must and does look for reasons outside of self to protect self. The teacher is a handy reason. The theme could be either: the teacher does not know how to teach or the teacher does not like me. To such a student, the teacher who frowns in an effort to concentrate on the student's words is frowning *at* the student whose anxiety then doubles.

On the other hand, one cannot discount the teacher as a factor in the situation. There are instructors and professors who are ineffective, who are sarcastic, who are inefficient. Typically, how are college faculty recruited? When a vacancy occurs, the tendency of the remaining members of the department is to recommend one from among the brighter graduates. An excellent academic record is, however, no guarantee that one can teach. A highly intelligent person may not know how to tone down for meaningful contact with the class, may not know how to motivate learning, nor how to present materials in proper sequence. He may not know how to evaluate learning.

It is interesting to note that while professional preparation is required for elementary and secondary teaching, no such preparation is sought of the collegiate faculty. A master's degree is now required for the tenure in the University and typically this is taken in the same major field as one's undergraduate concentration, thereby deepening one's mastery of the discipline — but not necessarily helping one develop better teaching strategies.

I am happy to report that there are two new programs in the University: the Master of Arts in Engineering Education and the Master of Arts in Fine Arts. These are concrete expressions of the need for teaching know-how at the college level. The curricula were worked out by joint committees of the Colleges of Engineering and of Education and of the Colleges of Fine Arts and Education, respectively.

Some students do attribute their failures to their own shortcomings: "Not really good in numbers." "Slow in math." "Have difficulty in oral communication." "Ashamed to speak up in class." "Don't know how to study effectively." "Cannot concentrate." "Not knowing how to budget time."

For the student who perceives himself as "not really good in numbers," it is to be hoped that his program requires the minimum of "numbers" only. The thought of remedial work in mathematics is not very well accepted in the tertiary level, most mathematics professors maintaining that the basics must be well learned earlier, in the secondary level.

"Have difficulty in oral communication" is a reason often given by the students who judges his command of language to be inadequate. Often he compounds his problem by not speaking up in class, thereby depriving himself of the practice so necessary for improvement. While Speech I is a required course in the General Education program, the student with this difficulty needs more time and help on this.

The student who is "ashamed to speak up in class" may be the same one who has difficulty in oral communication. Because of poor command of the language, he would rather remain silent. However, this attitude may stem from deeper feelings of inadequacy and/or earlier unpleasant experiences. The student uncertain of himself may think that his reaction or response to a point that has been made is not significant enough so he does not verbalize it. When the professor commends somebody else who makes exactly the same response he had in mind, he becomes dismayed over the lost opportunity to perform well. Counselling could help such an individual; so could a perceptive faculty member.

The one who "cannot concentrate" may be genuinely bothered by some problem external to academics. Financial problems, relationship problems may assume such gigantic proportions as to interfere with study schedules. In such cases one hopes that the condition is a temporary one. However, "cannot concentrate" may be an escape reason. A student who is faced with a difficult lesson which he fears he cannot tackle may really not make a sincere effort to study and to analyze his material. He may make a half-hearted effort and give up, saying that he cannot concentrate. In this manner he protects his image since "cannot concentrate" is much better than "cannot understand". Again sensitive counselling is called for here.

Study skills should be well established in the behavior repertoire of all collegians since such students will have had at least ten years of formal schooling. However, making a topical outline of a chapter or taking lectures/recording notes appears not only to need refurbishing but also to be new learning for many students even at this level. Happily, study skills can be taught at the tertiary level and when the student is well motivated, these can be easily and well learned.

A freshman may start "not knowing how to budget time." The relative freedom he enjoys may be partly responsible for the poor allocation of time slots for varied matters clamoring for his attention during the waking hours, can be resolved by the student with the help of a counsellor or a peer.

The Language Problem

Running through several of the problems described above is the language problem in the Philippine educational system. During the Spanish era, Spanish was the medium of instruction. As a tertiary education then was limited to children of Spaniards and of the more affluent Filipinos, language was no problem. Both groups spoke Spanish fluently.

When the Americans came and set out to establish a public educational system, they found a multiplicity of languages/dialects and no one common tongue. The authorities, balked in their attempt to identify one native language tnat could be used as medium of instruction throughout the country, decided on English. Hence, from 1900 to 1940 English was the sole medium of instruction at all levels.

In 1940, Tagalog was introduced as a subject in the elementary and secondary levels as this was to be the basis of the Filipino language. Since then Filipino has been increasingly used in oral communication in and out of schcol, but its acceptance as the national language in some parts of the country is at best lukewarm. The bilingual policy enunciated by the Ministry of Education in 1974 specifies that by 1980, in all levels. Mathematics, Science and English will continue to be taught in English while all other subjects will be taught in Filipino.

The students, therefore, have to develop adequate mastery of the two languages, a goal not easily attained by all students. In fact, one cannot help but wonder to what extent the expressed difficulties in mathematics and physical sciences can be explained by inadequate command of the English language.

Concluding Statement

With the explosion of knowledge and the advances in technology, more and more education appears to be imperative for the betterment of life for the individual as well as for society in general. That youth are aware of this is attested to by the numbers who seek admission to the tertiary level. Of those who do get admitted, not all succeed. The system, while seeing to it that academic standards of excellence are upheld, should exert efforts to enhance the learning opportunities in the academe. As suggested in this paper, the students perceive three major sources of difficulties. First is the curriculum. Articulation with the secondary level and periodic assessment in terms of course coverage, course-prerequisites and course relevance are called for.

Second is the faculty. The need for improvement in the recruitment procedures and for in-service training should be realized. Thirdly there is the student's total self. Generally those who step into the tertiary level do have the required intellectual capability to succeed. However, many are unable to draw fully upon their potential because of barriers real and imagined. Faculty consultation hours might suffice in some cases but many more may need the help of professional counsellors.

Toffler (1970) has said "In a world of accelerant change, next year is nearer to us than next month in a more leisurely era." Our youth have to be helped to learn how to cope with such a changing world. I hope that the total collegiate milieu will facilitate rather than obstruct learning and that in the classrooms there will be people (faculty and students) who will stimulate each other to give the best of themselves.

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7

CHARACTERISTICS OF UNIVERSITY STUDENTS AND THEIR LEARNING PROBLEMS

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Abstract

Education at the university level is education for those who are entering adulthood or adults. For undergraduate level, the range of age is about 18-24 years old. It covers the individual from late adolescence into early adulthood. According to Piaget's theory, this stage of life attains cognitive stage of "formal operations," which means students are capable of studying difficult subjects.

Students come to university with good intentions, eagerness and willing to work for society as a whole. Because of these characteristics students tend to be idealistic and wish for a better world. They are very concerned with their present day society and its future. At the same time, students are also examining and trying out various personalities to discover themselves and establish their own identities and life styles. Their interests lie in several directions and they are intuitive and curious. Their attitude and values are independent of family, community, and school. If the students are interested in something, they are willing to sacrifice their time and energy in pursuing their values.

Because of the elite system of education in developing countries, university students are academically prepared for studying at the university. Thus from many surveys, it is quite clear that their learning problems do not lie with their preparations but involve motivation and adaptation. It should be the duty of the instructor to motivate students and help them study. The contents of the courses should be interesting and relevant. The methods of teaching should be varied and attractive. We the instructors should realize that we teach human beings not the subjects.

Introduction

When comparing students at different educational levels, the students at the university level, especially in developing countries receive the least attention. On the contrary, the faculty at the university level received more attention and privileges than teachers at the other levels. Likewise when discussing the problems of teaching-learning process and how to resolve them, the interest is directed towards the faculty development, but the faculty development alone cannot be completely successful if they are not interested or concerned with the students. The success of teaching and learning is dependent upon the students not the teachers.

Some studies of college and university students are carried out because the student is conveniently available. Some are conducted primarily for political purposes and do not concern themselves with improving the university experience.

In this paper, the author presents ideas and knowledge on university students in an applicable term. The paper also limits itself to a summary instead of a discussion of research results. Data used in this paper are drawn from the printed materials from USA and the author's experiences in Thailand. Lacking in this paper is data from other Southeast Asian countries.

Age of University Students

Education at the university level is education for those who are entering adulthood or are adults. Who is a person about to enter adulthood and who is an adult?

According to Buddhism, a man at least 20 years of age can enter priesthood. Once he leaves priesthood, he is considered a mature human being. He is capable of being a family leader and pursuing the full responsibility of life. In Thailand, a person of 20 years of age is considered an adult because he has the right to vote and can join the military. Unemployment statistics begin at age 11. Adulted programs available to individuals 15 and above.

The ancient Greeks divided the age category by 7:1-7 years very small, 7-14 years a little bit larger, 14-21 adolescents and 21 years and over as adults.[1] But most psychologists consider the age 20 no longer an adolescent but as an adult. Roughly speaking, we can say that students 20 years of age are adults.

In general the commencement of adulthood begins after graduation from secondary school (age 16 to 17 years). But according to most psychologists, late adolescence ends at about age 15-16 years. According to "physiology", "from about 11 through 16 or 17 years the range of individual differences in physical structure and physiological function at any given chronological age is greater than at any other time in the human life span."[2]

For a working definition, it is reasonable to conclude in educational terms that *students begin university at the age of 17-18 years old and finish at 21-22 years old or 23-24 years old depending upon the curriculum*. Between 1974-75 academic year in Thailand, of the students seeking admission to universities 31.7% were 19 years old and 28.22% were 18 years old. Of the successful candidates' 35.97% were 18 years old and 30.01% were 19 years old. Therefore, education at this level covers from the individual late adolescence stage into adulthood and it is very important of the individual way for the well being of society.

Social and Economic Background

In developing countries the education process caters to the elites, which means only a handful of people are able to receive a high degree of education. Consequently entrance examinations are given to students at all levels which include: primary, secondary and university levels. Those who have passed the

[1]M.L. Clarke, *Higher Education in the Ancient World* (London: Routledge & Kegan Paul, 1971), p. 109.

[2]James S. Coleman and others, *Youth: Transition to Adulthood* (Chicago: The University of Chicago Press, 1974), p. 94.

various entrance examinations especially the university level, are *highly competent and have a fairly high social and economic standing*. Due to the limited time factor to produce data from other countries, I found it necessary to present data from Thailand only. The following breakdown of parents' occupations was obtained from the Joint Higher Education Entrance Examination, 1974-1975.

TABLE 1

Parents' Occupations	All Candidates		Successful Candidate	
Proprietors (Trade/Business, etc)	22,437	(50.78%)	5,652	(53.36%)
Government officials	10,328	(23.38%)	2,235	(21.10%)
Agriculturists	3,283	(7.43%)	602	(5.68%)
Employees	4,951	(11.21%)	1,340	(12.65%)
Others	1,787	(4.04%)	477	(4.50%)
Unknown	1,396	(3.16%)	287	(2.71%)
Total	44,182	(100.00%)	10,593	(100.00%)

It is clear from this table that the child of proprietors (traders/businessmen) and government officials have a better chance than a farm child. Also, most university students are definitely from wealthier homes.[3]

Cognitive/Mental Ability

In order to consider a student cognitive ability it is best to examine it through Piaget's theory. Piaget's cognitive considers formal operation the adult stage of life. At this formal operation stage, the adult is rational, able to pursue a future and understand abstract ideas. This stage begins at 13-14 years of age, but at this stage the student's cognitive ability is not as fully as it will be when he is 15-16 years old. It is, therefore, reasonable to say that adult life begins at 16-17 years old and many students who enter university are 16-17 years old. So it can be concluded that the student's cognitive ability is developed enough for them to begin studying the complex and abstract things.

The student's cognitive ability is also highly demonstrated outside the classroom as well. For instance, many students are effectively and successfully involved in voluntary development programs, music programs and sport activities.

The university student's cognitive ability at this stage is extremely high and *they are capable of studying difficult subjects if the content holds enough interest for them*. The student's lack of interest is not solely due to the

[3]Richard J. Kraft, *Student Background and University Admission* (Bangkok: Ministry of Education, 1964), p. 21.

student's cognitive ability but is partly due to the ineffective ways of teaching. Student failure cannot be blamed entirely upon their cognitive ability. There are many factors affecting it.

Attitude and Value

The life of university student begins with their family and in school. They do not encounter many serious life problems except for some academic pressure. Therefore, their attitudes towards themselves, friends, university life and society are positive. They enter the university with good intentions, eagerness and an excitement to change society, but their views gradually change as the year progresses.

Because of positive attitude and good intentions, students tend to be idealistic and wish for a better world.[4] They work diligently and are sincere in their endeavours; however, they feel cheated if they have not been given fair treatment by respectable authority or university officials. As Sanford stated,

> "He (student) perceives the world in clear-cut, simple, black and white terms. He detests hypocrisy and deceit. When he learns that the world cannot be put into two categories, black or white, he becomes disillustioned with this world and so he may become very critical of the present world or may wish to withdraw from it."[5]

The university students have also high traditional values. As Freedman stated, "The traditional moral virtues are valued by almost all students. They respect, sincerity, honesty, loyalty as proper standards of conduct for decent people."[6]

Besides having *high morals and virtues the university students are very concerned with their present day society and its future*. Freedman has summarized Jacob's findings as followed: "The current student generation is gloriously contented in regard to its present day activity and its outlook for the future."[7] If one examines the interest of the university students, their interests lie not among themselves but with the betterment of society. A questionaire answered by students at Thammasart University in Thailand concerning their learning problem had only one major complaint and that is the content of courses did not relate enough to the problems of the present day society.[8]

An interesting observation has been noted between students of developing countries and developed countries is that students in developed countries show a less interest in society than students in developing countries.

[4]Charles R. Monroe, *Profile of the Community College* (San Francisco: Jossey-Bass, 1971), p. 199.

[5]Quoted in Monroe, p. 198.

[6]Mervin B. Freedman, *Impact of College* (Washington, D.C.: U.S. Department of Health, Education, and Welfare, 1966), p. 12.

[7]*Ibid.*

[8]Paitoon Sinlarat, "Students' Views on Teaching-Learning Problems in University," Department of Higher Education, Faculty of Education, Chulalongkorn University, 1979, p. 3 (Mimeographed in Thai).

They are concerned with their own well-being, their family and materialistic items while students in developing countries are concerned with the problems of the low income and improving their standard of living.[9] As stated by one student at Chulalongkorn University.

> "I for one work very enthusiastically for my countries, society, community and for the later generations who will take over this land. Would you like to join me? Let us curse the selfish people and let us work to develop our country for the growth of our nation, society and the new generation."[10]

A notable fact that has been observed by many of my Thai colleagues and myself is that the student's attitudes and values diminish through the years. I am not sure if this is happening to students in other Asian countries, but if it is we ought to re-examine ourselves. Since the university is the place where students have set out to promote the ideal of self-sacrifice why do they instead become self-centered.

Personality

As stated earlier, the student's life at the university begins at late adolescent or the beginning of adulthood. At this stage, the students's personality has not fully developed and they test several types of personalities. When students enter the University their personality is not definite but by graduation time they are more certain of what they are searching for. As Monroe stated, "Young people have the opportunity to discover themselves and establish their own identities and life style."[11] Therefore, whether the students are studying inside the classroom or outside the classroom or on campus or off-campus, the experiences the students receive at this stage is invaluable.

At this point of time, the students are examining and trying out various personalities. *Their interest lies in several directions and they are intuitive and curious*. The teacher should develop the student's sence of curiousity to its fullest. Meanwhile the student's sense of curiousity and mistrust grow in things they encountered. They may develop a sense of anti-authoritarianism.[12] The teachers should not push their beliefs onto the students because students' beliefs and their attitude and values are independent of family, community and school.[13] On the contrary if the students believe in something, they are willing to sacrifice their time and energy pursuing it whether it be through students' clubs, politics, social affairs or any other activities. Hence *the most important element when dealing with students is complete honesty and sincerity*.

[9]Freedman, *Impact of College*, p. 13.

[10]Faculty of Education, *Welcome New Students*, (Bangkok: Chulalongkorn University, 1969). In Thai.

[11]Monroe, *Profile of the Community College*, p. 182.

[12]Payom Wannasiri, "Editorial-Nature of College Students," *Journal of National Education Commission*, 8, (June 1975), p. 5. In Thai.

[13]Joseph F. Kauffman, and others, *The Student in Higher Education* A (New Haven, Conn: Hazen Foundation, 1968), p. 25.

Change of Students' Attitude and Values in College Years

In the past, it was believed that university has little effect on students' values, personality and attitude, as Philip Jacob has indicated.[14] Later, the belief developed that university life has an impact upon personality and values of college students. As Wilson and associates have concluded,

> "This study indicates that faculty members do make a difference in the lives of students. Indeed, they appear to have even more impact than was indicated by the earlier research summarizd by Jacob (1957) and by Feldman and Newcomb (1969)."[15]

The differences between college students at different levels as concluded by Wallapa Sunalai's study:

1. Freshmen — They are excited about all activities; they are eager and willing to learn and want to adapt themselves to university life.
2. Sophomores — They became discontent towards their professor and the university.
3. Juniors — They like to be with their friends and become apathetic towards society and the university.
4. Senior — They are no longer interested in university life but are concerned about employment and their future.[16]

There is no definite pattern that the students follow but these are certain facts which help us to understand that they are no longer children but neither are they fully matured adults. Our problem is how to behave towards them so that they, not the teachers, will receive the most benefit.

It is difficult to say what exactly has affected this change but a list has been made from the most important to the least important factor. They are peer group, older peer group, professors and other aspects of the university environment.[17] In Thailand this project began in 1979-1980.

Student's Learning Problems

Before discussing the student's learning problems, the author would like to present data from Thailand as followed:

[14]See Jacob, *Changing Values in College*, p. 11.

[15]Hobert C. Willson and others, *College Professors and their Impact on Students* (New York: John Wiley & Sons, 1975) p. 178.

[16]Wallapa Sunalai, "College Student," Department of Higher Education, Chulalongkorn University, 1978, p. 6 (Mimeographed in Thai).

[17]Paitoon Kritpet, "Student Growth and Development," Department of Higher Education, Chulalongkorn University, 1978, p. 4. (Mimeographed in Thai).

TABLE 2

STUDENT'S LEARNING PROBLEMS[18]

Chulalongkorn University		Thammasart University	
Problems	Frequency (N = 171)	Problems	Frequency (N = 160)
1. Interest and responsibility	34	1. Content unrelated to society	37
2. Teaching and student-teacher relationship	28	2. Students and teachers relationship	30
3. Adaptation and using time	27	3. No chance for questioning	29
4. Content unrelated to society	21	4. Self-control and using time	20
5. Lack of books and equipments	20	5. Lack of books and equipments	18

Data from the U.S.

TABLE 3

FACTORS IN LEARNING SUCCESS[19]
(Chulalongkorn University Students)

Factors	X	S.D.
1. Student's Interest	2.53	1.56
2. Student's intention	3.43	2.01
3. Methods of teaching	3.55	3.26
4. Student's aptitude	3:67	2.09
5. Teacher's experiences	4.13	1.57
6. Personality of the teachers	4.99	2.31
7. Difficulty and easiness of subject	5.37	3.26
8. Books and equipments	5.69	7.93

[18, 19]These surveys were conducted by the author.

TABLE 4

REASONS FOR SUCCESS AND FAILURE

Reasons given by successful students for their success		Reasons given by unsuccessful students for their lack of success	
1. Good study habits	33%	1. Lack of study	25%
2. Interest	25%	2. Lack of Interest	35%
3. Intelligence	15%	3. Personal problems	8%
4. Family Influence	5%	4. Other	32%
5. Other	22%		

From the above data we are able to draw some conclusion:

1. The student's cognitive ability is not an important factor in learning problems, as have been supported by data collected in Thailand and the U.S.
2. The problem is not the level of difficulty or easiness of the courses but the choice of courses which is not directed towards society and its problems.

   In many developing countries that courses are unrelated to society's problems is a major issue in higher education. Most teachers have received their training from abroad and use examples from overseas.
3. Another important learning problem is *student's interest* and their learning intentions. As shown in Table 2, 3 and 4 both students in the U.S. and Thailand have the similar learning problem.
4. Studying habit of university students is not fully developed as indicated in the collected data from the freshman and sophomores in the U.S. and Thailand. If teachers can help students to develop their studying habits. This will improve their learning ability, I am sure. And my experience confirms this.
5. There should be good student-teacher relationship in and outside of class. From many studies, it is quite clear that good student-teacher relationship can promote learning in students.
6. The final problem is similar to other learning problems. But the solution is different. Some students like group learning, some like individualization, some like lecture, and some prefer to talk etc.

At the university students should be permitted to such experience in many fields, to receive a general education, to meet many types of professors, to learn from various methods, and to test many beliefs in order to complete their education as adults.

Conclusion

University students are unique. Although they are not adults and they are no longer adolescence, they all need love, success, satisfaction. They have high hopes, interested in society, the environment and themselves. They are interested in new approaches and want to improve living conditions. But their drawbacks are their youth, fast decision-making, quick tempered, and being over confident. Therefore, the teachers' duty is not merely to teach from text but is to teach our fellow human beings. The teachers are able to influence the students in many ways.

I have presented sufficient information about the characteristics of university students. But there are no answers to many questions. Finally, I would like to conclude this paper with the following questions,[21] which I constantly ask myself as part of my effort to be a more effective university teacher.

- To what extent are you aware of the diversity of student interests that exist in your classes? What are you doing to relate the course content to those various concerns?
- Is your teaching style uniform or do you employ a variety of techniques depending on the nature of the students, the course material, or the teaching setting?
- What kinds of oral and visual presentation techniques do you use to stimulate student interest in course materials?
- How do you go about conveying your enthusiasm for teaching to your students and colleagues? Do you discuss teaching and learning issues with your students and colleagues?
- Do you know who the best teachers are in your own department or school? The worst teachers? Have you ever observed their teaching? Upon what other kinds of evidence do you base your feelings that these are the best or worst teachers?
- Do you try to overcome the natural barriers between students and faculty? How do you go about indicating your accessibility to students?
- How effectively do you use casual and informal conversations with students outside the classroom as a vehicle for teaching?

Do you agree that these question are important? And what are your answer?

Acknowledgement

The author would like to express his special thank to Miss Bhamani Chantarasmi and Miss Suanta Chaturapit for their effort in translating this paper, which is originally written in Thai.

The students mostly mentioned are students at the undergraduate level.

[20]Henry Clay Lindgren, *The Psychology of College Success* (New York: John Wiley & Sons, 1969), p. 49.

[21]Wilson and others, *College Professors and Their Impact on Students*, pp. 193-194.

Suggested Readings

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UNIVERSITY STUDENT CHARACTERISTICS AND TEACHING TECHNIQUES

	Characteristics of University Students		Recommendations for Teaching Techniques
1.	High ideals	—	Respond to expectations
	High expectations	—	Maintain expectation
	High Motivation (Tendency to decrease in later years)	—	Expose to problems. (Instructor embodies ideals; is an examples)
2.	Interested in society & environment	—	Point out social problems; relate studies to life;
	Wants responsibility and desire to solve problems.	—	Can see real problems and relationship of studies to life.
	Sympathise with disadvantaged (Tendency to become more self-centered in later years)	—	Teach through problems, real situations. (They see problems, see real situations, see their roles)
3.	Independent; self-reliant Anti-authoritarianism	—	Provide data, fact and opportunity for self-study.
	Questions prevailing values and beliefs	—	Let them identify their own rationals/reasons; make their own choice
	(Tendency to become less independent and more suspectable to prevailing values)	—	Should not try to control o threaten; let them decide for themselves (They study on their own, undertake independent study).
4.	Interested in Change	—	Provide workable solutions
	Seeks improvement	—	Suggest change
	Creative (Tendency to be more conservative)	—	Provide opportunities for action, practice, creative, research etc. (They are willing to do things, solve problems, make improvements)
5.	High intelligence	—	Let them study difficult, complex subject.
	High endurance	—	Can give them hard work to do (with reasons)
	Puts full energy into interests (Tendency not to use ability to full capacity)	—	Let them help with useful work. (They involve in the learning process).
6.	High group affiliation	—	Use groups
	Solidarity	—	Provide them with opportunities to organize
	Not trusting in other group (Tendency to less affiliation)	—	Provide opportunities for exchange (Seminars, discussions, exchanges)
7	Wide range of interests Involved in many activities Meets with variety of people	—	Provide different atmospheres, variety activities, give them choices.

PAPERS ON INSTRUCTIONAL PROBLEMS AND METHODS OR STRATEGIES USED FOR OVERCOMING THEM

8

INSTRUCTIONAL PROBLEMS AND METHODS OR STRATEGIES USED FOR OVERCOMING THEM

by
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Abstract

I begin by giving my own definitions of educational technology and of instruction and then go on to raise four questions, which an educational technologist should ask concernng instructional problems in higher education:

1. How can we make students more independent in their learning?
2. How can we teach for understanding?
3. How can we help teachers to teach better?
4. How can we help students to learn better?

In attempting to provide some answers to the first two questions, I refer to both research results and practical experience, both of which point towards the necessity for active participation by students in their learning. In different ways this can be achieved through individualised learning and group learning, and I particularly mention the work initiated by Keller on the former and that of Black and Abercrombie on the latter.

I see the answer to the third question in staff training and development which uses the same active methods as advocated previously for student learning, and I refer briefly as an illustration to the on-going programme of staff development at Universiti Sains Malaysia.

In answer to the last question, I again suggest that we should employ the same active teaching methods.

In conclusion, I draw attention to the difficulties that may arise if the assessment methods which we employ do not match the new methods of instruction, and conversely the difficulties that will arise when we do attempt to match them. I end by warning that the new methods of instruction advocated, which transfer some of the teacher's authority in and responsibility for the instructional process to the student, may well make teaching more exciting but it may also make it less comfortable.

Introduction

I would like to begin by explaining how I interpret two concepts which are referred to in the heading for this paper; "educational technology" and "instruction". As for the former, I cannot better a definition given by Rowntree[1] that educational technology is —

> "a rational problem-solving approach to education, a way of thinking sceptically and systematically about learning and teaching."

Put another way, I am concerned in all my work with the technology *of* education, and not in the first place with the much more restricted use of technology *in* education, although that too is important. As for instruction, this to me is all of that part of education which is concerned with the formal processes of learning and teaching.

Now let me turn to the subject of this paper. The fundamental aim which, in my opinion we as university teachers have for our students is that by the time they leave us they should be able to learn on their own and that they should be able to learn in such a way that they not only know but also understand what they know. This statement is made deliberately vaguely and I shall try to firm up on it later, but even in this vague form it is clear that in my opinion our aim should go much beyond that of making sure that our students acquire a certain body of accepted knowledge. I say this with some force, because a study of university examinations, such as for instance that made by Black[2], reveals that this lesser, though not unimportant aim is likely to be given undue prominence in the assessment of students and hence in the students' view of what we as teachers think a university education is.

In forty minutes one can deal with only a small number of problems and, in the light of what I have said so far, I shall confine myself to two:

1. How can we make students more independent in their learning?
2. How can we teach for understanding?

We shall find that in attempting to answer these questions, we are inevitably led to two further ones:

3. How can we help teachers to teach better?
4. How can we help students to learn better?

Here the word "better" is short for "so that our declared aims are more likely to be achieved".

In the remainder of my talk I shall say something relevant to each of these questions. While I shall base my remarks largely on British experience and experiment, my more limited experience elsewhere leads me to believe that our conclusions are more generally applicable and in particular are of relevance also to universities in the region in which we find ourselves at the moment. Similarly, while as a scientist I shall report mainly on results obtained in science teaching, I have found that my colleagues in the humanities find many of the results of relevance also to them.

How can we make students more independent in their learning?

When educational technologists first tackled problems of student learning, they concentrated — quite rightly — on questions concerned with the more efficient acquisition of a body of knowledge. In this connection, there is an obvious paradox in traditional university teaching, namely that while we would all agree that students differ in what they know, how they learn and what they are interested in, yet in a lecture we treat them as if they were all alike. It stands to reason that if somehow we individualised learning, i.e. matched it more closely to each student's requirements, learning might become more effective.

At first sight, the various forms of individualised learning do not give the impression that they give the student greater independence than traditional teaching methods, for they all depend on carefully structured learning materials with general firm instructions on how the materials are to be used. This is particularly true of all forms of programmed instruction, and only marginally less so of personalised systems of instruction such as the Keller

Plan[3] or the Audio-Tutorial method[4]. Indeed, when I first experimented with the Keller Plan[5], my main aim was to ensure that students — and particularly weaker students — should learn more effectively what I was teaching them, and I had no other aim in mind.

Let me illustrate the principles of individualised learning through a brief description of the Keller Plan. In a Keller Plan course, students work individually through study units and are tested on each unit before proceeding to the next one. The key to the plan is mastery of the prescribed subject matter. If one demands such mastery, then one cannot have it in a definite time, since students learn at different rates and even the same student does not learn at the same rate at different times. Hence the course must be self-paced, which means that it cannot be given through lectures. Instead, students are given carefully prepared and structured learning materials which enable them to study on their own. When students feel that they have mastered a unit of study, they take a test on it, which is marked and discussed with a tutor, who may be a lecturer, a postgraduate student or even an undergraduate student. Only if at the end of the discussion, student and teacher agree that the material in the unit has been mastered, may the student proceed to the next unit.

There is now a great deal of experience with the Keller Plan[6, 7], and the evidence is accumulating that for the acquisition of knowledge it is more effective than traditional teaching[8, 9]. I want, however, to go beyond this and claim that it also provides a first step towards independence in learning. I began to suspect this when students in my first Keller Plan course stated that they did not feel that the method tended to spoonfeed them; rather the opposite, they found that they were given much more freedom to work within the broad framework provided by the units[5]. Perhaps the most conclusive evidence that the Keller Plan experience leads to lasting improvement in learning methods comes from a longtitudinal study of two groups, one of which had been taught through Keller Plan and the other through traditional methods[10]

To conclude this section, I would stress that because individualised learning methods in general only provide a strictly circumscribed freedom for students, they are more suited to the initial stages of a university course than to later ones when students should be given progressively greater authority over how and what they study. This consideration takes us to our next question.

How can we teach for understanding?

This problem is ever present in the minds of teachers and is perhaps of particular importance in the teaching of science, where students are often able to reproduce great areas of knowledge, but are unable to re-formulate this knowledge in different ways or use it in unfamiliar contexts. It is however by no means confined to the teaching of science.

Most of the research which psychologists have conducted into learning has been concerned with learning as such and has tried to investigate the "how" of learning independently of the "what" of learning. This is not possible in any investigation into learning for understanding, since this involves the application of what has been learned and methods of application differ greatly for different subject content. This was appreciated by Marton[11] who deliberately departed from research tradition and investigated how

students tackled a particular learning task, which was within their curriculum of study, and what the learning outcomes were. In the first part of the investigation he interviewed students and asked them to describe how they set about reading a text and was able to divide their approached into two kinds, which he called "deep" and "surface". Students who used a deep approach to their reading, explained it through phrases like "tried to get at the point of it", while a typical surface approach was indicated by "I just read straight through without looking back at anything." Put another way, the former students made an active approach to the subject under study, while the latter passively allowed the subject to approach them.

In the second part of the investigation, Marton analysed the answers which the students gave to questions on their reading and found that, by and large, those students that had used a surface approach in their answers essentially reproduced the actual words and phrases of their reading, while those that had used a deep approach, gave answers in their own words and thus described what the reading was about, i.e. they had achieved what I would call an understanding of what they had learned.

I have described Marton's work in some detail because, although the results which he obtained might be thought to be sheer common sense, this is in fact not quite true, since the sharp separation between the approaches, which he found, was quite unexpected. It immediately raised the question as to how teaching might be organised so that it would lead to active learning by students.

The idea of active learning takes us back to a concept in the psychology of learning, developed much earlier, that of mental schemata[12], defined as "an active organisation of past reactions or of past experiences which must always be supposed to be operating in any well-adapted organic response". Bartlett hypothesised that learning involved the assimilation of information which entered the mind from outside to schemata existing in the mind due to previous experiences. This interaction could both distort the incoming information and also change the schemata. That this was indeed so was demonstrated in a classic study by Abercrombie[13], who showed that in the realms of both visual and cognitive perception, we tend to distort what we perceive so as to make it fit to our previously acquired schemata and to reject it, i.e. not perceive it at all, if we cannot fit it at all.

Finally, before describing some approaches to teaching for understanding, I want to show how such teaching should be fitted into a curriculum. I turn here to an idea of Ausubel[14], who refers to learning for understanding as "meaningful learning" and points out that there are two quite independent dimensions, along which learning can vary. The first stretches from rote to meaningful learning, corresponding to Marton's shallow and deep learning, while the second stretches from "reception learning", in which the learner receives information from the teacher, to "discovery learning", in which the learner himself selects the information to be learned. In his map of learning, fig. 1, he draws attention to the fact that these two dimensions are different from each other by giving examples of both rote — discovery learning and of meaningful — reception learning. The map is a powerful aid for any teacher who wishes to select appropriate strategies for any particular teaching task. Since in this section we are concerned with meaningful learning, we shall confine our attention to the upper region of the map.

Let me now turn to some teaching strategies which have been developed to help with meaningful learning or, as I have called it, learning for understanding. The simplest of these relates to situations in which students may be assumed to possess the appropriate schemata. Even there it will still be necessary to remind students of them so that they have them at what is called the forefront of their minds, since experience shows that otherwise they may still fail to connect the new information with what they already possess. For these reminders, Ausubel[15] has developed his theory of "advance organisers", to bridge the gap between what the learner already knows and what he needs to know before he can successfully learn the task at hand. At its simplest, this consists of the old advice to 'say what you are going to say", but this would presumably not be effective unless the first time one said it, it "bridged the gap". To do this, Ausubel suggests that it should not be a mere summary or overview of what is to follow, but should provide explanatory and integrating connections between previous material and new material.

I next turn to a technique which has been developed for the teaching of mental skills, of the kind which we expect a professional scientist to possess and shall try to analyse it in terms of the concept of schemata. An example of such a skill is that of making order of magnitude estimates, which is one that every physicist needs and in which physics students are notoriously deficient. Black[16] has developed a technique, known as skill sessions, in which a group of sixteen to twenty students is broken up into four sub-groups, each of which is given the same task, which might for instance be to make an order of magnitude estimate of some situation. After half an hour each sub-group makes its report to the group as a whole and the four reports are then compared and discussed under the guidance of a tutor. Black claims that the combination of tutor-less discussion followed by tutor-led de-briefing session is an effective method for training mental skills.

The fact that the teaching of such a skill is difficult needs some explanation. The reason for it obviously cannot be that the students are, say, incapable of rounding off their data to two significant figures, so we must look for something deeper. When we analyse what is required in order of magnitude calculations, we realise at once that rounding off and the arithmetical operations involved are the trivial part. What is difficult is to estimate just how accurately something has to be known in the particular circumstances in question, since this requires powers of judgment. Not only may the student lack the necessary schemata for this, but the need for them runs counter to the normal schema induced by school science, namely that science is something which is definite and where judgment does not enter. Thus we may be faced here with the problem of creating new schemata which are in opposition to firmly established ones.

The problem of creating appropriate schemata and dislodging inappropriate ones was tackled by Abercrombie[13], who was concerned with the training of medical students. Her methods have recently also been used in the teaching of physics.[17] In contrast to Black, she used tutor-led small groups of about eight students, who were given much more open tasks than those which Black used, and asked to discuss them. The tutor acted as a facilitator, keeping as much in the background as possible, and in no sense as a discussion leader. Under these conditions, the processes in the group were similar to those more familiar from therapeutic groups; individual differences between

the members became overt and led to tensions, just because the differences were often due to very different mental schemata held frequently unconsciously by the members of the group. Such tension seemed necessary, if schemata were to alter, but the intervention of the tutor was required at times to prevent them from becoming too disturbing.

What both Black's and Abercrombie's methods have in common is that they face students with the realization that different students may tackle the same task from quite different premises and with quite different methods, leading to quite different results, and that these differences do not necessarily amount to one being right and the other wrong. I have found that this demonstration of relativity and subjectivity in science can be a shattering experience for students who until then had a schema according to which science was absolute and objective, and even if the experience was something less than shattering, it clearly could be sufficiently powerful to destroy old schemata and create new ones.

How can we help teachers to teach better?

The methods of individualised and group learning, which I have described, differ in many ways, but there is one thing they have in common: they make students more active in their learning — which is needed according to Marton's findings — by transferring part of the initiative in the teaching and learning process from the teacher to the learner. With this goes a partial transfer of authority and control, i.e. the teacher has to take more of a backseat and has to accept that good teaching is not an end in itself but an adjunct to successful learning.

These changes in the teacher's role are quite radical. At present, teachers acquire their schemata concerned with teaching from those who were their teachers while they were students, and these teachers considered themselves as authorities in their field and were accepted as such by their students. Furthermore, this attitude of teachers and students had remained essentially unchanged from generation to generation since the foundation of the first universities in the middle ages. The change of schemata which we require from our teachers is therefore quite as radical as any which we require from our students.

To achieve it requires processes similar to those which I have suggested for students and in the first place requires teachers to again become students, i.e. to undergo some form of teacher training. At this point I wish to pause in order to review the position which I have reached.

Many teachers in universities accept that there have been developments in teaching methods which they ought to know about and they may even be prepared to attend short courses in order to learn about them. However, they see such learning as merely the acquisition of new knowledge and possibily new skills, while it is my contention that many of these new teaching methods are meaningful only in terms of a radically changed outlook on teaching, i.e. they require a change in accepted schemata.

If I am right then not only is it necessary for teachers to undergo training in order to become "better" teachers, in the sense in which I defined it in the introduction to this paper, but such training must take on the new forms which I have advocated for the instruction of students. Without this, no significant changes in the instruction of students can be expected.

I have been concerned with the training of university teachers for ten years, but the most ambitious programme in which I have ever been involved is at the moment in progress at the Universiti Sains Malaysia[18] and I would like briefly to report on this in order to illustrate my case. USM established an Educational Technology Unit in 1974 which over the next few years, with the active support of a Senate Committee on the Teaching-Learning Process, organised a number of staff training and development activities. In 1978, this Committee invited two persons active in staff development in Britain, Dr. Gaye Manwaring from Dundee College of Education and myself, to organise a staff development programme with the help of the Educational Technology Unit. We visited USM during July-August 1978 for six weeks and organised a number of training workshops including a brief but intensive one for the top administration lasting half a day, and a residential and even more intensive one for junior staff lasting four days. Our main effort, however, was directed at a group between these, namely certain more senior staff in the Schools of the University who were prepared to put their creative powers at least as much towards teaching as towards research and who might in due course play a major role in developments in teaching and learning in their Schools. After returning to Britain, we designed a programme for such staff, consisting of a distance earning course over four months followed by an on-campus course of four weeks and I am sure that it is a great satisfaction to all concerned that this course is now running with participants from nearly every School at Universiti Sains Malaysia. The distance learning course is naturally taught through individualised learning materials, while the on-campus course, which will take place in July and August, will be built around group activities and individual consultations. In this way the course as a whole faithfully reflects the instructional innovations which I have suggested in this paper as appropriate for students. How far we shall succeed in our aims, it is at present too early to tell, but we hope that to the extent that we do, our course may be useful for others who wish to organise similar activities. The scheme is described more fully in an Appendix to this paper.

How can we help students to learn better?

I want finally to return to students. Our difficulty here is that they are quite likely to have been conditioned to fairly passive methods of learning during their previous education, since unfortunately examinations at secondary level are even more likely to favour such methods than those at university level.

There is no doubt that many students need help if they are to make the most of their study at university, and while this is so even under traditional teaching, it is all the more so when students are expected to be more active in their learning. Methods of helping students to study reflect teaching methods in general. Traditional methods include books on "How to study", lectures and individual counselling, while innovative methods use group discussion and individualised learning.[19] Since the last of these may be the least well known, I will briefly describe a way by which I included study advice in a Keller Plan course[20]. I did this by briefly giving detailed advice in the individual units of the course, keying each piece of advice to a learning activity which formed part of that unit. The same advice was given again in later units,

keyed appropriately to activities in those units, so as to provide reinforcement. I do not expect that so comparatively superficial a procedure could change long acquired habits and there was no evidence that it did. On the other hand, there was evidence that it encouraged and reinforced good habits where these already existed and that is probably as much as one could hope for from this activity. It may be noted that the total cost of producing the advice — time and materials — was about £300 and that it was available to over 100 students over two years. Against this one might set the cost of a university education, which at that time was about £2000 per year for each student. Thus if the advice should have prevented even only one failure in the two years, it would have amply paid for itself.

Conclusion

I have presented a number of arguments for changes in teaching and learning in higher education and illustrated them with a few examples of actual practice*. I have also suggested that such changes will not be effective unless we combine them with help and training for teachers and students, and I have given examples of practice there too. I want to present here a note of warning, concerning the assessment and examination of students, once we have changed the methods of instruction. Any method of assessment which recognises that students have been taught for independence and understanding must try to discover aspects that are in the mind of the student, without having been put there by the teachers. It is therefore not possible to specify in advance with the same precision what a good examination answer ought to be as in the case when one examines rote learning. This uncertainty must be accepted; it is a small price to pay for the increase in the relevance of what is being examined.

Finally, teachers must realise that the uncertainty of which I have just written also exists in the instructional processes which precede the examination. Anyone who teaches for independence and understanding must be prepared to forsake the cosy security that goes with teaching for rote learning, for once the teacher shares with the student the responsibility for and the tasks of both teaching and learning — and this is what active learning really means — then the unexpected becomes the expected. This may be more exciting, but it is not always comfortable.

*I have given a number of such examples, by no means applicable only to physics, in an earlier article[21].

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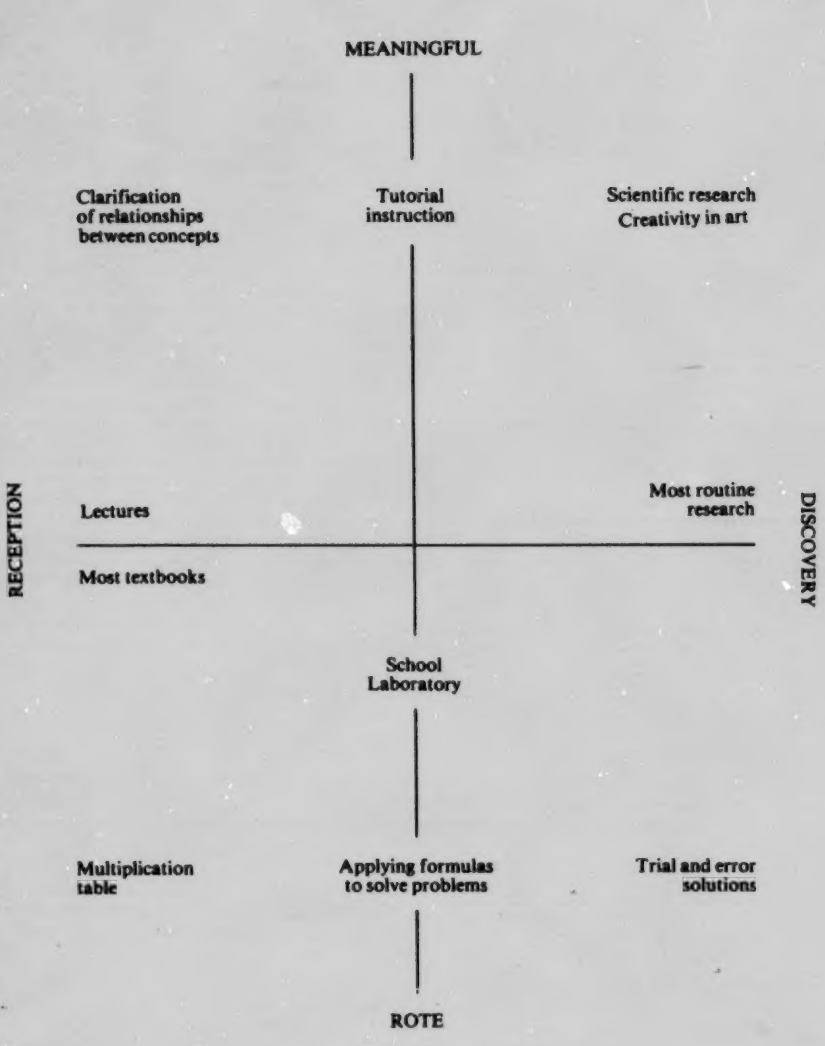

FIGURE 1

THE MAP OF LEARNING, AFTER AUSUBEL
[Adapted from Novak (1977)]

STAFF DEVELOPMENT AT UNIVERSITI SAINS MALAYSIA

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Gaye Manwaring
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(Handout for the exhibit shown at the International Conference on Teaching-Learning Process in Universities, 12-16 June 1979, USM, Penang, Malaysia)

The programme of staff development at USM, to be described, has come about through a close collaboration between ourselves and the Educational Technology Unit at USM. The Unit had previously organised a number of workshops and activities, concerned with teaching and learning, for academic staff during 1975-1977. When in 1978 we were invited by the University to advise on and assist in a programme of staff development, we were attached to the Unit and organised a number of activities with the help and support of its staff.

The activities ranged from lengthy discussions with the administration and Deans to an intensive four-day residential workshop for junior academic staff, with a number of one-day workshops and seminars in between. As a result of our experience we came to the conclusion that a university such as USM required two kinds of staff to run a full staff training and development programme. There was need firstly for a small number of full-time academic staff in a staff development unit, and secondly for a much larger number of experienced staff in the Schools of the University to assist the full-time staff and provide liaison between the staff development unit and the rest of the university.

We recommended that the full-time staff would require a one year full-time training and that the experienced staff in the Schools might need a full-time equivalent training of about three months on a part-time basis. The two kinds of training should be viewed as a co-ordinated programme which included courses in Britain, courses in USM, correspondence courses using specially designed distance learning materials, and local resource centres. We considered the use of specially designed materials, both in the correspondence courses and in the local resource centres particularly important.

The above recommendations were broadly accepted and form the basis of the staff development programme which has been started.

The training of full-time staff

This is being provided through the Postgraduate Diploma in Educational Technology of Dundee College of Education (see handout on exhibition stand) with field work at the University of Surrey. One member of staff from USM will take this course during 1979/80.

The training of experienced staff from the Schools of the University

A special programme has been constructed for the experienced staff from the Schools. It consists of a distance learning part during April-June 1979 and an on-campus part from 23 July to 23 August 1979. During the distance learning part, materials are sent from Britain and tutorial help is available on campus. The programme staff is as follows:

From Britain: Professor Lewis Elton, University of Surrey
Dr. Gaye Manwaring, Dundee College of Education
From USM: Associate Professor Boey Chee Khiew, Educational Technology Unit
Dr. Chan Geok Oon, Educational Technology Unit

Distance learning part. This is being run in two parallel streams:

(A) **A general introduction to teaching and learning methods**

This is based on the "Information-by-Post" scheme at Surrey University, which consists of a number of packages, each containing a specially written introduction and reprints of relevant materials. The following packages are being used and can be seen on the exhibition stand:

- On lecturing
- Small group teaching
- Assessment and evaluation
- The overhead projector
- Tape/slide presentations
- Objective and short answer questions

(B) A course on individualised learning

This course uses some of the existing materials of the Postgraduate Diploma course in Educational Technology of Dundee College of Education (some of which are shown on the exhibition stand), but the larger part of it is written specifically for this course. It will consist of eight Units, all of which are shown on the exhibition stand:

0. Introduction to the course
1. What is individualised learning
2. Types of individualised learning
3. Course planning
4. Writing a structured learning unit I
5. Writing a structured learning unit II
6. Improving the first draft
7. The role of the teacher

On-Campus part. During the first three weeks, members will have regular meetings with the programme staff, and during the final week there will be a residential course for more junior staff, similar to the one held last year, for which members from the experienced staff course will act as tutors. The meetings during the first three weeks will continue the two activities (A) and (B) above on a more individual basis, and will give members an opportunity to prepare individualised materials in their own disciplines. They will also provide an opportunity to prepare members for their role as tutors during the fourth week.

Conclusion

The staff development programme has taken off to a good start, but it is too early to tell how it will develop. In due course it ought to be evaluated and if it is shown to have been successful, it could form a model for other universities with similar needs to USM.

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INSTRUCTIONAL PROBLEMS AND METHODS OR STRATEGIES USED FOR OVERCOMING THEM — THE PHILIPPINE EXPERIENCE

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A Summary

The problems of the teaching-learning process are in effect problems of communication. Hence, to understand the problems, it is of first necessity to postulate certain principles of learning and their learning outcomes. These are:

	Activity	Principle of Learning	Outcomes
1.	Conation (doing)	Principle of self-Activity	Abilities (habits and skills)
2.	Affection (feeling)	Principle of Motivation	Attitudes (ideals, values, appreciations)
3.	Cognition (knowing)	Principle of Apperception	Knowledge (facts and meanings)

Whence arise the problems? There are three (3) sources:

1. The teacher
   a. no concept or poor concept of a philosophy of education and educational/curricular objectives;
   b. poor knowledge and appreciation of the principles of learning and their outcomes;
   c. lack of knowledge and skill in college teaching technics and classroom management;
   d. poor motivation for teaching.
2. The student
   a. inadequate preparation for college learning;
   b. inadequate interest, motivation, appreciation;
   c. failure to see relevance of subject-matter to his needs;
   d. non-conducive learning environment in the home and the community.
3. The administration
   a. too heterogenous/too large grouping of students;
   b. failure to provide an adequate environment for the teaching-learning activity;
   c. failure to provide teaching aids or educational technology;
   d. certain constraints imposed by laws and decrees.

How solve these problems?

1. relating to teachers
   a. pre-service education programs;
   b. continuing education program, from workshops to degree courses;
   c. a rationalized hiring policy.
2. relating to students
   a. meaningful cooperation between the teacher and the administration on all aspects of the teaching-learning process, thus bringing to the students the most effective strategies and methodologies;
   b. teacher-administration cooperation exposes students to innovative strategies, such for example, as the Systems Approach to Teaching.
3. relating to administration
   a. selective admission, improvement of facilities, more controlled groupings of students;
   b. accreditation;
   c. special fees for needs of educational technology;
   d. increase in tuition and other fees as allowable by law.

It might be mentioned that no matter what strategies and methodologies are effectively put into operation to solve the problems of the teaching-learning process at the tertiary level, problems will persist and the strain on the already strained limited resources will continue for as long as there is no tangible improvement in the pre-college levels.

Finally, it must be noted that each institution of higher learning tries to solve its problems of the teaching-learning process according to its resources. What is important and imperative is to use those which will produce results within a given context and circumstance. And they will produce results if the relationship between teacher and student is strengthened and enhanced. In the final analysis, since education is a human activity, it must be conducted humanely and humanistically.

This paper limits the discussion on the problems of the teaching-learning process at the tertiary level and the strategies and methodologies used for overcoming them to those observable in the Philippine context, particularly private education. Because it is possible that the problems at the tertiary level may be traceable to the elementary and secondary levels, it is well to mention that in the Philippine system, there are six (6) years of the elementary grades (exclusive of pre-elementary, which is not a requirement of law or government, but only of certain schools) and four (4) years of secondary. As mandated by the Constitution, elementary education is compulsory and secondary only where it is feasible or economically viable in different provinces or regions. Further, Bi-lingualism — English and Pilipino, the national language — is the current policy of the Ministry of Education and Culture. It is now the transition period during which the medium of instruction at the elementary level is shifting from English to Pilipino and more subject-textbooks are being written in Pilipino. English, however, remains as a subject. At the secondary

level, Pilipino is required both as a medium of instruction as the language of the textbooks in some subjects, e.g. Social Studies. In time, the medium of instruction in all subjects will be in Pilipino. English remains as a subject. At the tertiary level, Pilipino as a subject is required in all curricula, e.g., Business Administration, Engineering, Teacher Education, and Nursing. English continues for the present as the medium of instruction in all the other subjects. In many instances, teachers use both languages as media of instruction. It might also be mentioned here that private education in the Pilippines is under the supervision of and regulation by the State, through the Ministry of Education and Culture, as mandated by the Constitution.

The problems of the teaching-learning process are in effect problems of communication. As long ago as the 13th century, Thomas of Aquin aptly described the process as one of contacting the educand's mind to gain its cooperation in its own development. To contact, that is, to communicate with the educand is the essence of the teaching-learning process. To fail to contact or to meet with obstacles and obstructions while establishing contact is the root cause of all the problems one encounters in the teaching-learning process. Hence, to understand the problems, it is of first necessity to postulate certain principles of learning and their learning outcomes.

They are: *one,* that which relates to conation or doing, namely, the principle of self-activity, that is, "a student learns through his own activities" (Cunningham, W.F. *The Pivotal Problems of Education. New York:* MacMillan Co., 1957.) and the learning outcome is abilities (habits and skills); *two,* that which relates to affection or feeling, namely, the principle of motivation, that is, "an activity is learned more easily, to the extent that it is motivated by interest" (*Ibid.*) and the learning outcome is attitudes (ideals, values and appreciations); and *three,* that which relates to cognition, namely, the principle of apperception, that is, "every new idea is learned to the degree that it is assimilated to other ideas already in the mind," (*Ibid.*) or "Thinking is linking" (*Ibid.*) and the learning outcome is knowledge (facts and meanings).

However, it is well to mention here that all three principles are operative, or should be, in the act of learning. The educand, while exercising his powers of self-activity in trying to link the unknown with the known, can best do it if he is properly motivated. Quite obviously, then, if the principles of learning are successfully applied or implemented in teaching, there is every chance that the learning outcomes will be developed in the educand. On the other hand, when their application or implementation meets up with obstacles or obstructions, problems arise in the teaching-learning process.

The question, then, may now be asked, whence arise these problems? In the Philippine context (and this paper does not speak of problems insofar as their frequency or intensity of occurrence is concerned, but only as they are known to exist in private institutions of higher learning), there are three (3) sources of problems, namely, the teacher, the student and the university administration. On the part of the teacher, the following may be enumerated: *one,* no concept or poor concept of a philosophy of education and educational and curricula objectives; *two,* poor knowledge or lack of knowledge and appreciation of the principles of learning and their outcomes; *three,* lack of knowledge and skill in college teaching technics and classroom management; and *four,* poor motivation for teaching.

On the part of the student, his learning difficulties stem from: *one,* inadequate preparation for college learning particularly in communication skills, cognitive skills (analysis, synthesis, application and evaluation), and learning skills (self-learning, note-taking, research or locating sources of knowledge); *two,* inadequate interest, motivation, appreciation and enthusiasm due to passive learning and lack of feedback of learning and to inability to set learning and life goals; *three,* failure to see relevance of subject-matter to his needs due to lack of knowledge of objectives of courses, lack of continuity of different subject-areas, non-relatedness of subject matter to experiences; and *four,* non-conducive learning environment in the home and in the community.

On the part of the university administration, the problems are: *one,* too heterogenous and too large a grouping of students; *two,* failure to provide an adequate environment for the teaching-learning acctivity, including teaching incentives, supportive services and organizational support; *three,* failure to provide teaching aids or educational technology; and *four,* certain constraints imposed by laws and decrees.

Let us explore these problems. *Firstly,* except for teachers in the colleges of teacher-education, the college teacher begins teaching without formal studies or even readings in the philosophy of education and therefore is quite inadequate in understanding and appreciating educational and curricular objectives. He hardly has any concept of what a curriculum is or even why his teaching subject is in the curriculum, except perhaps because it is needed to get a certain degree. And yet, if a curriculum is to be effective as an instrument in achieving an institution's educational philosophy and objectives, it must be designed and structured not by the administrators alone but with the assistance of the teachers, for it is they who will implement and operate it in the classrooms.

Secondly, because of a lack of knowledge and appreciation of the principles of learning and their learning outcomes, the teacher fails to gain the cooperation of the student in his own development. He, as it were, spoonfeeds him with information, which the student in turn memorizes, soon to be forgotten after examinations or even before. He sprays the student with facts and data without helping him to realize relational values and meanings. Much as a bricklayer lays brick upon brick to put up a building, the teacher piles one datum upon another, but the student experiences no knowledge growth. He fails to understand, appreciate and control life, which, according to Will Durant, are education's goals. (CF. Annex I) The teacher, failing to motivate, encounters a class of blank faces or poor achievers. He fails, too, to widen the student's apperception. And if his course is a skill course, the student learns enough to pass the course according to his standards. Obviously, there are exceptions and because of these exceptions, Philippine's higher education has competently met the demands and needs of society and national development. But we are here discussing problems and not exceptions.

Thirdly, not having gone through a teacher-education institution, the college teacher lacks knowledge and skill in college teaching technics and classroom management. He is subject centered, so he informs and explains, incessantly lecturing, perhaps to ask a question here and there or conduct a recitation which is another way of saying that the student returns to the

teacher idea by idea, information by information, as originally transmitted to him by the teacher. To evaluate student performance, he rates examinations and tests by the correct information the student is able to provide. There is very little regard for relational associations and for meanings behind facts. Hence, the student passes from one teacher to another and his knowledge is fragmented, isolated and compartmentalized. However, the obvious exception is the teacher of a skill course, say, accounting or dentistry. He is able to develop in his student the skill required by the profession. But even here, there are those who are happy teaching the student enough to pass the course, without motivating or stimulating the student to further honing of his skill.

Fourthly, the teacher is himself poorly motivated. There are a number, whether on full-time or part-time tenure, who look upon teaching as purely a means for earning a living or for additional income. What matters to them is the economics of the job, not its responsibilities. Hence, their professional attitude and behavior leave much to be desired. This is not, of course, to say that teaching is not a means for earning a living. But the well-prepared and properly motivated teacher while earning a living by teaching, feels deeply responsible for the outcomes of his teaching and teaches effectively, efficiently, sincerely. In the truest sense of the word, he is an academician.

Perhaps the problems of the student are even more alarming. *Firstly*, the Philippine Ministry of Education and Culture administers the national College Entrance Examination (NCEE) to all students graduating from the secondary curriculum. Only by qualifying in this examination may a student seek admission to an institution of higher learning. In the schoolyear 1979-80, the Ministry's cut-off point for admission is 35%ile, up from 30%ile in the last two years. This is evidently a very low cut-off, but it has to be because there are certain areas in the Philippines which are economically disadvantaged and culturally deprived, where the educative process is not as effective as in the other areas. It is politically untenable to cut off these areas from chances at access to higher education. Nonetheless, even with this examination, a number of students enter the university inadequately prepared for college learning. They have poor cognitive skills, weakly able to analyse and synthesize, apply and evaluate. They resort to memorizing. Their learning skill is likewise poor, as evidenced by their inability to learn on their own, to take down notes, to locate sources of knowledge, and to inquire or question. Hence, their comprehension and communication skills are by the same token inadequate.

Secondly, due to passive learning and to a lack of feedback of learning, the students lack interest, motivation, appreciation and enthusiasm for learning. This is heightened by their inability to set learning and life goals. So they trudge along from day to day, from class to class, from term to term, until after having fulfilled all requirements they graduate. Whether they can cope with the demands of their professional and personal lives, only time will tell.

Thirdly, perhaps the most burdensome problem of the university students is their failure, because they have not been helped, to see relevance of subject-matter to their needs due to a lack of knowledge of objectives of courses and of continuity of different subject-areas. Worse yet, they see only nonrelatedness of subject matter to their own experiences or to their intended

profession. Thus, they perceive learning as a drudgery or something one has to do because it is the demand of society, or because it is customary, or because it is the parents' choice.

Fourthly, the students suffer from an environment in the home and in the community that is non-conducive to learning. Even in the home, there is no longer a premium to learning. The home library, if there is one at all, is insufficiently stocked. There is a better collection of discs and tapes for the stereo and the tape deck. There is, too, the TV, which seems perpetually tuned in. And if the family is poor or economically distressed, then time after school is spent on odd jobs, not on reading or studying, because every extra centavo counts. There are, too, the distractions in the community. Movies, billiards and pool, discos and beer gardens, sports and games — all these tend to attract the attention and interest of the students. This is not to say that legitimate leisure should be avoided, or that it is not needed by the students. This is merely to point out the distractions that exist in the community to which the students may be drawn and in which they may be deeply involved to the detriment of their studies.

The university administration has its share of problems. *Firstly*, while schools administer a selective admission process, still not much rationalized attention is paid to the placement of students in classes, resulting in large and/or too heterogenous groupings. The high cost of managing a private institution of higher learning necessitates the maximization of plant use. As much, therefore, as is feasible, every classroom or laboratory, is used every hour during the day, or up to 9 or 10 o'clock in the evening, if an institution has night classes for working students. And every classroom or laboratory is filled with students as can comfortably sit. Such may not be the best situation for the teaching-learning process to take place in.

Secondly, since the cost of education has been rising, development of institutional facilities has not kept pace with the increase of enrolment or with the newer demands of education and society. This is especially true of private universities, which receive no subsidy or appropriation of government funds; they are, in fact, taxed. Institutional development must depend on additional capitalization, but private capital is now shying away from education, or on loans from commercial banks. Except for the Engineering Education Development Program, the government does not offer soft loans to private educational institutions. Since there are very few private schools charging high tuition fees, the rest must make do with what they have or can afford. Hence, the learning environment varies from poor to excellent. Teaching incentives, supportives services and organizational support vary accordingly, too.

Thirdly, university administrators realize the pedagogic value of teaching aids, such as audiovisual materials and equipment, or the software and hardware of educational technology. With bigger classes or heavier teaching loads, they have become a necessity in the universities. But how much and how far they will be used depends on the resources of the universities. As has been mentioned before, Philippine private universities are hard put to meet rising costs.

Fourthly, probably the most serious drawback to managing a private university is the imposition by laws, decrees and orders on both the academic

activity and the financial management. Ever so often, the Ministry of Education and Culture requires compulsorily the offering of certain subjects, upsetting curricular unity or dislocating curricular structure. Presidential Decree No. 451 controls the increase of tuition and other fees, not only by the amount of increase, but also by requiring certain percentage allocations for salary (69%), institution-building (28%) and return on investment (12%), which, incidentally, is all that is allowed by law, although schools are even now hard put to declare between 5% and 10% dividend. There is no freedom to allocate funds as needs arise or as problems materialize. And, as has been mentioned above, there are taxes to be paid, such as real estate tax, corporate tax, income tax, tax on imports of educational equipment and materials, including books. Consequently, funds are limited and are channeled to the improvement of teaching facilities and environment very judiciously. More and more financial wizardry is needed for the financial management of Philippine private schools.

Lest the impression be given that the problems are insurmountable or unsolvable, it must be mentioned here that under the circumstances, most Philippine private institutions of higher learning do manage to give quality education, or an education that meets with the expectations of both parents and the community, including the demands of national development. For there are strategies and methodologies for meeting the problems headlong. Problems relating to teachers, for example, are being solved by any or all of the following strategies: *one*, pre-service and in-service education programs to acquaint teachers with a philosophy of education, principles of learning and learning outcomes, principles of teaching and methodologies, curriculum design as to objectives and contents, and to assist them in writing up a syllabus of the course they will teach or are teaching and in preparing their own teaching modules. They must be able to show relevance of subject matter to the student's learning and life goals, an integration of theory and practice (this is why in the professional schools, teachers are also professional practitioners, e.g., practicing accountants teach accounting, practicing dentists dentistry, etc.) and a relation to other courses in the curriculum or in the totality of the student's education. *Two*, a continuing education program for faculty development to expand their knowledge and sharpen their skills not only in the art of teaching, but also in their profession, if they are teaching a professional subject. Programs range from seminar-workshop to actual work toward an advanced degree, particularly the Master of Arts in College Teaching, which is offered by many Philippine graduate schools, and perhaps toward a Ph.D. or an Ed.D. Programs stress most especially that what is important in teaching is the interaction between student and teacher, between student and student, and among all the supportive services that contribute to the student's development as a person. The teacher is made to understand that whatever the pedagogical method is or whatever educational technology is used, it is used merely as an instrument for contacting the student's mind to gain its cooperation in its own development. The teacher is still the manager and facilitator of learning, not its dispenser. *Three*, a more rationalized hiring policy and procedure. While the hiring of teachers has become problematical, because there are not many available, or if available, not totally qualified, still hiring is rationalized to forestall the entry into teaching of those who show no

potential at all, or whose motivation for teaching is questionable or doubtful. The competition from trade, business, industry and research, and in some instances, even government, is so strong that the drop-out from the teaching profession is alarmingly great, or that the teaching force of a university has become mobile, that is, the turn-over is rather quick. Rationalized hiring has a number of factors, such, for example, as higher hiring rate for those highly qualified, shorter probationary period, tenure, incentives for advancement, such as fellowships, scholarships, sabbatical leaves, and other benefits. A big incentive, of course, is promotion in rank according to an established criterion. To the new teacher, this is a challenge. The potentially good teacher takes up the challenge.

The problems of the student can be solved and are being solved by a meaningful cooperation between the teacher and the university administration. The sharpening of the teacher's teaching skill should be a continuous effort. He may be well-versed in a number of methods and technics, but unless these are re-learned, re-worked and revised, they become stale and teaching becomes routinary and uninspired. At present, the most commonly used technic is the lecture method, especially in large or medium-sized classes. However, the lecture has been known to become boring and as an instrument of producing learning, its merits are in some cases doubtful. Unless a lecture is spiced with questions that challenge the student's mind, clarifies information and meanings by showing relevance to the learner's experiences or proposed learning and life goals, allows for student questions and opposite views, is made interesting by anecdotes and humor, lecturing will become the least productive of learning. In fact, it is now the resort of the mediocre teacher, whose views cannot be challenged by the students.

Depending on course contents and objectives, on curricular levels, on student achievement, various technics are also being used. Self-learning kits and teaching modules have been developed, case study method initiated, reading lists assigned, term papers or project reports required, field trips held. Moreover, in small classes and at advanced levels, seminar-type or round-table discussions are held. There is much use, too, of audiovisual materials and equipment, although their sophistication varies from poor to excellent, from school to school, because not many teachers are aware of the correct use of audiovisual technics. In skill courses, practicum or internship is required by some institutions, done either in school or out of school in cooperating offices, industries and other agencies. In the case of students in teacher-education colleges, for example, practice teaching, under the guidance of a critic teacher, is conducted either in the laboratory school of the college, or in public elementary and secondary schools in a consortium with the Ministry of Education and Culture. Incidentally, tutorial is not very popular, as it is the most expensive to operate. Occasionally, there are remedial classes for the slow learners or those whose expected achievement is deficient.

A necessary concomitant, in fact, the *sine qua non* of the successful implementation of all the strategies and technics already mentioned is the policy and the attitude of administration. Academic freedom is guaranteed the teacher in private institutions of higher learning, for this is mandated by the Philippine Constitution. Tenure is assured, whether the teachers are members of a teacher-union or not. Benefits are given, such as sick leave, study leave,

fellowships, scholarships, research grants, maternity leave (legally required), sabbatical leave, retirement, etc. Promotions in rank are released periodically. Increments in salary are distributed, whether as a result of negotiations with the union for a Collective Bargaining Agreement (CBA) or not, or because of the implementation of PD 451. previously mentioned. Moreover, administration conducts in-service and faculty development programs without cost to the teachers for the improvement and enrichment of their professional and personal lives. Some administrations are so innovative that they try, at least on an experimental basis, to initiate and operate recently developed strategies. One example is the attempt at operating the Systems Approach to College Teaching. The educative process or the system that produces the educated has certain components which have been all along considered vital to the operation of the system. The System Approach, however, reckons with all these components, not separately, nor independently, but rather in a unified whole where each component is considered in consonance with the other components to bring about the desired and designed goals and objectives. In a word, learning is not the sole responsibility of the teacher alone but of all who are engaged in the educative process working together to achieve the same objectives. These components are: "(1) Instructional purposes, stated as intended changes in the behavior of students; (2) the initial status, capabilities, and purposes of the students; (3) the status and capabilities of the professors and corollary professional and technical staff; (4) the status and capabilities of certain non-human resources of the educational institution; (5) techniques of managing the availabilty of each of the elements of the system — logistic capability; (6) program evaluation and improvement." (Brown, J.W. and Thornton, J.W. *College Teaching: A Systematic Approach*, 2nd ed., New York: McGraw-Hill Book Co., 1971, p. 63) As adapted to the Philippine context, these components of the system are reckoned in terms of the society it serves: its resources and its needs, its capabilities and its potentials, its problems and its realities. Thus, operating within this societal milieu, the system produces graduates needed by the various activities of the society and, in turn, society feeds the system with data and information, with assistance and expertise, even perhaps logistics, to keep the system viable and relevant. (cf. Annex II) The operation of the systematic approach to college teaching may be likened to the application of technology to medicine. "Whereas the physician of half a century ago was at once diagnostician, surgeon, pharmacist, nurse, X-ray technologist, and laboratory technician, he now delegates many routine tasks to persons of less demanding training. He may even delegate to them the operation of several items of electronic equipment, such as the electrocardiograph. Thus, he not only receives more accurate information, but is also freed to apply his own skills to interpreting diagnostic information and to prescribing necessary treatment. A wholehearted adoption in education of the systematic approach would permit the same economical use of the rare talents of the instructor, as well as the talents of each of the other human and material components of the system." (*Ibid.*, pp. 62-63) Further, the system presupposes that all components are equally reckoned with, that is, not one component is allowed to be deficient to the point of weakening the whole system. Or, if it does weaken, it is given priority of attention so that it is brought back to full play. For exam-

ple, the failure of the manager of the system, the administration, to produce data and profile of the students insofar as their capabilities, status, purposes are concerned will hinder and hamper the teacher from effectively pursuing methodologies intended to bring about the avowed objectives. As stated above, the systems approach is being experimented upon just now. Given time and the necessary organizational support, it might prove to be the most effective strategy in overcoming problems in the Philippine teaching-learning process.

Finally, the problems of administration enumerated above are not beyond solution. *Firstly*, the continuing pressure of an expanding population on access to higher education necessarily perpetuates certain problems of admission and placement of students in classes. However, more and more Philippine institutions are admitting students selectively with varying degrees of strictness and accommodation. At least, in the freshman year, more homogenous placement of students is being attempted. In the upper years, because most schools allow freedom of choice in study load and subject schedule, classes become heterogenous. Some are putting up new buildings to house classrooms and laboratories, where government assistance has been given, for example, the Engineering Education Development Program of the Ministry of Education and Culture, as was mentioned above. The Ministry chose twenty (20) Engineering schools all over the country, which were given soft loans through the Development Bank of the Philippines for civil works, equipment, library and faculty development. The money was loaned originally to the Philippine Government by the Asian Development Bank. Hopefully, similar government assistance to other programs of private education will be forthcoming.

Secondly, a Federation of Accrediting Associations of the Philippines (FAAP) has been organized for the large scale operation of accreditation. Those which federated are the Philippine Association of Colleges and Universities Commission on Accreditation (PACU-COA), the Philippine Accrediting Association of Schools, Colleges and Universities (PAASCU), and the Association of Christian Schools and Colleges Accrediting Agency (ACSC-AA). Accreditation is purely voluntary and not too many institutions have yet been accredited. However, because of accreditation, institutions have to improve not only their academic offerings, but their facilities and plant as well. In time, accreditation, as a strategy for improving Philippine private education, will be more widely accepted and its value appreciated.

Thirdly, because of cost, there has not been an extensive use of educational technology. However, from time to time, the Ministry of Education and Culture allows the collection of special fees for special purposes solely. For example, a Statistics Laboratory fee has been allowed, but only students enrolled in statistics using the laboratory can be charged this fee. Thus, they are able to use calculators and other apparatus. While no fee is charged for the use of audiovisual equipment, schools do have audiovisual departments of varying sophistication, as part of the students' tuition fees is allocated for this purpose, particularly in schools where there are a number of large classes. For the use of Speech Laboratories, students pay a fee; thus educational management is able to maintain a high-grade laboratory and hire experts in speech. These are just some of the examples by which Philippine institutions of higher learning are managing to give their students the benefit of educational technology in the teaching-learning process.

Fourthly, the latest Memorandum from the Minister of Education and Culture eased somewhat the procedure for applying for increase in tuition and other fees of private schools. For the schoolyear 1979-80, schools are allowed a 10% increase without the necessity of filing some of the papers and documents normally required by PD 451. However, for schools seeking a 15% increase, all the usual supporting documents will have to be submitted, which are, among other things, the financial report, the justification for the increase and its allocations, the salary of all teaching and non-teaching personnel, the budget, etc. further, a committee has been constituted by President Marcos to study ways and means by which government assistance may be given to private schools. It has become obvious to government planning officers that private schools are performing a public service, as about 90% of students at the tertiary level are in private institutions. While more state institutions of higher learning have been organized or established, still the government must allow the operation of private schools. To ban their operation or to take over is neither politically expedient nor socially acceptable.

It might be mentioned here as an addendum that no matter what strategies and methodologies are effectively put into operation to solve the problems of the teaching-learning process at the tertiary level, problems will persist and the strain on already strained limited resources will continue for as long as there is no tangible improvement in the pre-college levels, that is, at the elementary and secondary levels. In the Philippines, about 80% of elementary school children and about 50% of the secondary are in the public schools. Hence, when the results of the Survey of Learning Outcomes in the Elementary Schools (public and private), conducted by the Educational Program Implementation Task Force (EDPITAF) of the Ministry of Education and Culture, were released showing the poor performance of public school children, the Ministry instituted a crash program that did away with the Continuous Progression Scheme and launched the Back-to-the-Basics curriculum. In brief, the potential for success of college-bound students depends to a large extent on their education at the pre-college levels.

In conclusion, it must be noted that each institution of higher learning normally tries to solve its problems of the teaching-learning process according to its resources. There are strategies and strategies. There are methodologies and methodologies. What is important and imperative is to use those which will produce results within a given context and circumstance. And they will produce results if the relationship between teacher and student is strengthened and enhanced. Less and less personal contact between them brings about cold impersonality, the bane and problem today of human relations in all human activities. In the final analysis, since education is a human activity, it must be conducted humanely and humanistically.

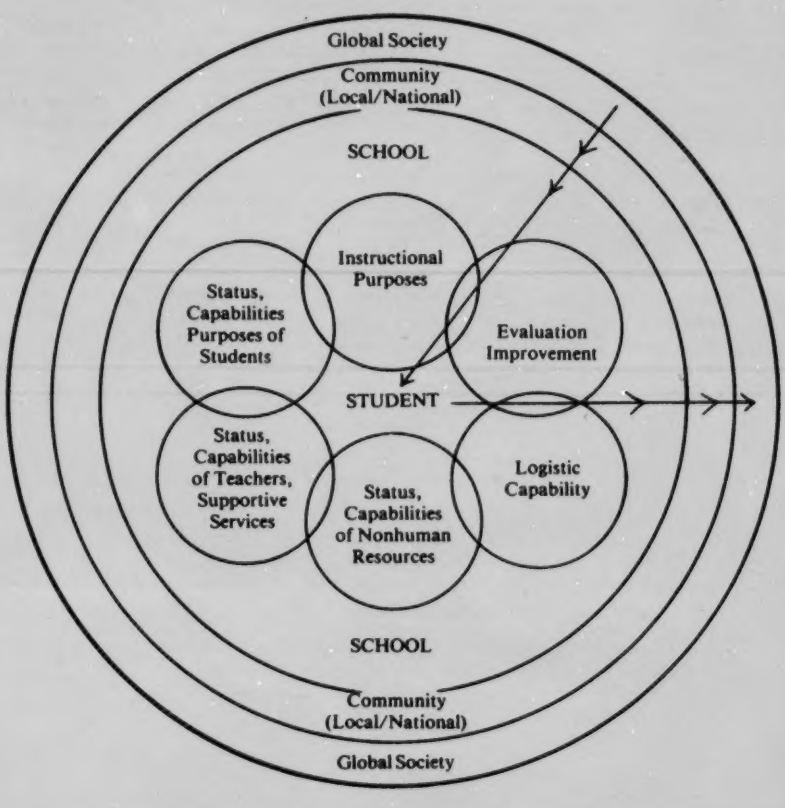
ANNEX I

PRINCIPLES OF HUMAN LEARNING*

Mental Functions	Animal Learning	Human Learning	Outcomes of Human Learning	Durant's Goals
Cognition (knowing)	Law of Readiness	Principle of Apperception	Knowledge (facts and meanings)	the understanding of life
Affection (feeling)	Law of Effect	Principle of Motivation	Attitudes (ideals and appreciations)	the enjoyment of life
Conation (doing)	Law of Exercise	Principle of Self-Activity	Abilities (habits and skills)	the control of life

*W.F. Cunningham, *The Pivotal Problems of Education* (New York: MacMillan Co., 1957), p. 149.

SYSTEMS APPROACH TO TEACHING*



*Adapted from Brown, J.W. and Thornton, J.W. *College Teaching: A Systematic Approach*, 2nd ed., (New York: McGraw-Hill Book Co., 1971)

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INSTRUCTIONAL PROBLEMS AND METHODS OR STRATEGIES TO OVERCOME THEM — A CASE STUDY IN THE TEACHING OF MICRC ECONOMICS

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Synopsis:

The paper explores some instructional problems encountered at the Faculty of Economics, Chulalongkorn University, Bangkok. The problems are concerned with the competence and attitudes of staff, the experience and subsequent expectations of students and the difficulties encountered in determining relevant content for a course in economic theory. Some approaches to teaching are described which, it is argued, may reduce the magnitude of some of these problems. The paper concludes with three general questions about the educational philosophy expressed in the approach.

> *"The learning process is still something of a mystery. It is a little 'black box'. Much goes on inside it; some of this is painful, some is exciting. But we do not know exactly what is happening nor fully how to affect it. Learning depends on the special interactions between individual students, individual teachers, and individual subject matters at particular moments of time and involves all the manifold complexities of students, of teachers, and of subject matters. Environments can be changed and may help, sometimes substantially but more often in marginal fashion. The learning process, however, remains a whole series of quite personalised responses. There is no substitute for a good student, a good teacher, and a mutually interesting subject. Nearly everything else can be helpful or harmful or merely peripheral but not decisive. The long history of attempts at academic reform testifies to the conclusion that structures, reward systems, technology, and facilities can be changed much more readily than people. Yet the learning process centres on people."*
>
> Carnegie Commission on Higher Education (1972)

The Carnegie Commission on Higher Education clearly identified three factors which contribute to learning — people, processes and environments. I would agree with the Commission that people, that is the academic staff in universities, make the most important contribution to the outcomes of learning. Equally important, I would argue that people also make the major contribution to the problems encountered in learning.

In this paper I propose to explore the instructional problems derived from the attitudes and actions of some academic staff in one faculty of my University and to describe the action being taken to minimise those problems. It will take many years before we know if our efforts have contributed to an improvement in learning. Nor can we tell if our actions are the best approach. But we are trying.

The study of a specific case in this paper may not meet the expectations of those who seek general solutions to specific instructional problems. But I would argue that study of specific cases, rather than reviews of general educational principles is more likely to assist and encourage teachers facing comparable difficulties in their own disciplines.

If instructional problems are largely derived from the attitudes and actions of academic staff operating in a particular situation, then solutions to those problems are to be found in actions which take account of the people involved and their situation. Instructional problems are specific — not general.

This paper is divided into three sections.

The first focuses on the problems of teaching micro-economics at the Faculty of Economics, Chulalongkorn University, Bangkok. Those problems concern the competence and attitudes of staff, the experience and subsequent expectations of students and the difficulty in determining and agreeing appropriate content.

The second section details methods of teaching developed to meet those problems. Those methods are derived from a Micro Core Course, Case TIPS-Micro Package developed by Professor Keith Lumsden at Heriot Watt University Edinburgh.

In the third section, arguments are presented as to why these methods seem likely to meet the problems described in Section 1.

1. The Problems

1.1 Competence and attitudes of Staff

The problems which emerge from some staff are largely based upon questions of their attitude. As the Carnegie Commission observe and as I firmly believe attitude is the foundation to competence in teaching.

The first and most basic problem is a lack of commitment to teaching. This is evident in the limited attention paid to teaching and the effort expended on other activities which bring financial reward. The second problem is the superficiality of teaching. This is evident in a lack of preparation and failure to adequately cover the syllabus in the breadth and depth required. The third problem, derived from the former conditions is the obvious lack of concern for the good name of the University and for the competence and education of the students. The fourth problem relates to extreme differences in grading practice. Some teachers who have not adequately covered the syllabus may still be prepared to give good grades. This form of grade inflation causes distress to staff who seek to maintain professional standards. One outcome may be a drift of students towards those classes where good grades are easily achieved.

1.2 Student experience and expectations

The problems affecting students are partly derived from earlier experience at schools, from a failure of academic staff to fully meet their expectations and also because of the attitudes and competence of staff. Students leave school with experience of highly structured programmes. Many staff fail to recognise that students need a gradual transition from structured programmes to more independent study. Staff may fail to offer the necessary guidance and support. Secondly, because of the indifference and lack of competence and drive of some staff, students may also be disappointed in the demands made upon them. They may expect a significant increase in the level of knowledge on entering the University, but fail to find it.

The third problem affecting students derives from the attitudes of staff. When teachers focus on grades rather than the significance of the subject or excitement in learning their students soon develop the same views.

1.3 The question of content

Establishing suitable aims and determining the appropriate content of courses is a responsibility faced by all academics. In developing countries such as Thailand however, it is vitally important for academic staff to ensure that courses are relevant to the needs of society and match the social responsibilities felt by students. Unfortunately, a number of staff, particularly those educated abroad, fail to recognise and meet their responsibility. Courses may then become too theoretical and difficult or standards abandoned and made too simple.

2. Approaches to Teaching to meet the Problems

The approaches developed may best be described in terms of i) elements of the course package ii) management of the course team.

2.1 Elements of the Course Package

The package is divided into two work books: a student work book and a teachers hand book.

2.1.1. *Student work book*

This starts with a study guide, instructional plan and time schedule. This sets the objectives for the course, gives the study tasks for each week and details the tests and learning processes for each unit, including the role of remedial tutorials.

There are four main elements to the students package, lecture notes, prescribed readings, case studies and tests. Lecture notes, written by groups of the course team are carefully designed to be relevant to Thai society and at an appropriate level for the students. The lecture notes are divided into units within an agreed time allocation.

The prescribed readings are specific to sections of the lecture course or to the case studies. The readings detail chapters and pages of books or journals. The case studies are based upon Lumsden's cases but modified to be more appropriate to the Thai economy.

There are two elements to the tests in the student work book. The first is a pretest of economic knowledge. The second, the TIPS surveys, are multiple choice tests given once per week. Results from these tests are used to give immediate feedback to students, to advise them on how to improve and to identify those students who should attend remedial tutorials.

2.1.2 *The Teachers Handbook*

This handbook contains all the information in the student work book with four additions. The first addition is the answers to the TIPS surveys together with guidance on the type of feedback to be given to students should they make an inappropriate response. The second addition is an analysis of each case study prepared by the course team. The third addition is the examination papers to be given three times each semester for grading student performance.

The fourth addition is a student feedback questionnaire for evaluation of the course and the teaching process. It is important to recognise that a number of elements in the student work book and the teachers handbook will be changed every semester. Changes will be made in the TIPS survey, the case studies and the pretest and examination papers. Lecture notes will also be reviewed in the light of student feedback and the development and ideas of the course team.

2.2 **Management of the Course Team**

The concepts of the course were first presented to the academic staff at a meeting of the Faculty of Economics. A proposal to try the approach was agreed by the Faculty Board. A course team of twelve recruited "volunteers" was selected to ensure the involvement of staff with different interests and experience.

This team attended orientation seminars on four afternoons before starting to prepare the work book. Participants examined the principles of the approach and considered how the structure would help staff and students. Tasks, such as writing units for the lecture notes and preparing cases, were allocated to groups of 2-3 staff at the close of the seminar.

The full team was involved in discussing the aims and content of each topic before writing began. This discussion ensured that the content was relevant to society, the level of difficulty was appropriate to the aims and prior knowledge of the students, and the TIPS questions and cases were suited to the aims.

When preparation of the materials was completed the team agreed to the allocation of individual teaching responsibilities. This could have been difficult. However, we believe that the existence of the course materials removed some of the doubt and apprehension about what each teaching task would require.

Involvement of the team continues throughout each semester. This ensures feedback on teacher performance and the teaching process in the lectures and remedial tutorials.

The outcome from this team effort is totally dependent upon the interaction of the participants. Without careful management to ensure goodwill and sensitive support to each other, the methods in themselves cannot produce the desired outcome.

3. Why are Methods likely to solve the Problems?

It is hoped that the approach may assist in meeting some of the problems derived from the competence and attitude of staff, from the experience and expectations of students and from the difficulty of determining relevant content.

3.1 In Terms of Teachers

The key to improvement in the competence and attitude of staff is to be found in the team approach. Participation in the team generates commitment to ones colleagues and a hightened sense of responsibility. It also appears to bring the reward of support from ones colleagues and opportunities for personal and professional growth in a less threatening situation.

The particular advantages are:

3.1.1 The aims of the course are made clearer to members of staff and to students. Since all members of the team are involved in specifying those aims they have a clearer commitment to their achievement.

3.1.2. Discussion among the team members allows for an improvement in the subject competence of some members of the team and broadens the perspective of others. It also extends the critical thinking of some team members.

3.1.3. The public declaration and evaluation of content which occurs when individuals present written work to colleagues ensures an improvement in the professional standard. Feedback on written lectures or cases can be particularly valuable to those members of staff with limited experience in preparing papers for professional journals.

3.1.4. Supportive co-operation in the group develops a more positive and responsible attitude in individuals. This understanding includes concern for colleagues as well as a sense of responsibility to students and to the institution.

3.1.5. The focus on feedback as a key element in learning reduces the tendency for staff and subsequently students to be solely concerned with grades. The group responsibility for tests and examinations further ensures that there is no tendency to grade inflation.

3.2 Students

The key to reduction in student problems would appear to arise from the provision of relevant materials in a carefully structured and supportive environment. The particular benefits which may arise are:

3.2.1. Students encounter clear guidance for their study and receive the concern and support from a team of staff.

3.2.2. Students have the freedom to learn from each of the elements in the course, as they find appropriate to their past experience.

3.2.3. Through working as a team on the case studies, the students learn to co-operate with one another, to understand a little more about human relationships and to be responsible to ones colleagues.

3.2.4. The opportunity for self directed study is expected to generate more self confidence in the students and to help them to be more self motivated and independent.

3.2.5. The difficulty of the course is more likely to meet their expectations.

3.2.6. Immediate feedback helps students to improve their knowledge and understanding. Since the TIPS and case studies are clearly for feedback purposes, it is hoped that students will be a little more concerned with learning and a little less concerned with grades.

3.3 **Content**

Since the team pools the knowledge and views of its members, several advantages arise.

3.3.1. The course is not biased towards the interests of one member.

3.3.2. There is more chance to make the content relevant to Thai society. This is particularly difficult with a theory course.

3.3.3. The responsibility for decision about content is shared.

3.3.4. The standard is improved.

Summary

This paper has described an attempt to meet specific instructional problems in one environment. We must admit that we are not sure if the problems described are THE problems. We are not sure if the approach being tried is THE best approach. We would leave you therefore with three questions which you may care to consider.

1. Are instructional problems largely human problems?
2. Are there general solutions to specific instructional problems or must each problem be approached in context?
3. Should one seek to innovate without guarantee of success and with difficulty in measuring success?

11

INSTRUCTIONAL PROBLEMS AND METHODS OR STRATEGIES USED FOR OVERCOMING THEM — DEVELOPMENT OF A TEACHING SKILLS TRAINING SYSTEM BY PROTOCOL APPROACH

by
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Introduction

There are many instructional problems on teaching-learning process in universities. At this conference, I will discuss the problems focused on teacher education.

Both pre-service and in-service training can be broadly classified into three major areas of instruction: (1) curriculum content, (2) professional knowledge, and (3) classroom skills. I will now discuss the problems connected with (2) and (3) above.

Professional knowledge pertains to pedagogical concepts and principles of behavioral science the teacher needs in order to understand and deal with problems related to pupils and educational process. These concepts are usually taught in courses, such as educational psychology, child development and educational evaluation. Unfortunately, those courses in our country are organized and presented far too often as a body of theoretical-abstract principles. The conceptual leap from the predominantly abstract-academic orientation of these courses to the grim performance realities of classroom must be made by student teachers. Most student teachers fail to bridge this gap between the theory and the performance.

Classroom skills, the third area in teacher education, deals with the specific teaching skills, planning skills, and behavior pattern which helps the teacher to function properly in the classroom. Such training is usually assigned to so-called "methods courses". In these courses the trainee is confronted with an unbridgeable gap between the content presented and the skills actually needed in order to teach effectively. All that students can obtain from such courses in only academic knowledge about teaching.

Having reviewed the current state of most teacher education programs in our country, we felt it necessary to prepare some integrated courses between methods courses and student teaching. To meet the necessity, we have developed a teaching skills training system by protocol approach.

The rationale for creating and using protocols or protocol materials was probably first brought to the attention of the education community by B.O. Smith and his colleagues. Their report states:

> Teachers fail because they have not been trained calmly to analyze new situations against a firm background of relevant theory. Typically they base their interpretations of behaviour on intuition and common sense.....

Furthermore, the Smith task force asserts that "the basic elements of theoretical knowledge are concepts" and the concepts are effectively conveyed to teachers under the background of the image for instructional situations explained by appropriate concepts. This assertion have promoted the protocol materials movement on teacher education. Dr. Cruickshank, professor of the Ohio State University, defined protocols as follows:

> ".....an original record of an event of educational significance utilized in order to permit learners to interprete the event or solve the problems depicted in the event, using appropriate concepts from related fields of study including psychology, sociology, anthropology, philosophy, or others."

It may be said that using protocol for the training of teaching skills is a reality approach to vitalize teacher behavior in instructional situations. Our system deals with training of teaching skills by means of videotape which show various classroom scenes. Now we are developing the programs for training skills of effective questioning in science teaching. This development is based on two major considerations.

1. From the findings of analysis of science teaching, we believe that the skills of effective questioning play a major role in the pupil's cognitive processes.
2. We also believe that the relevant program of the instructional simulation will bridge the gap between methods courses and student teaching.

As a first step we intended to investigate the existing teaching skills of student teachers. Driven by necessity to promote the investigation, we developed a category system of teaching skills. We will discuss them in the next section.

Development of a Category System for Questioning Teaching Skills

In order to survey the existing teaching skills, at first, we used the system of analysis developed by J.B. Hough and J.K. Duncan of the Ohio State University. Their system, called Observational System for Instructional Analysis, OSIA for short, is a type of interactive communication analysis. The OSIA category system is shown in Table 1.

TABLE 1.

OSIA Category System (By Hough, J.B. and Duncan, J.K.)

	Teacher's Code	Behavior	Student's Code
Substantive	T1	Substantive clarification	S1
	T2	Response to substantive solicitation	S2
	T3	Initiation of substantive information	S3
	T4	Solicitation of substantive response	S4
Appraisal	T5	Corrective feedback	S5
	T6	Acceptance	S6
	T7	Confirmation	S7
	T8	Positive personal judgment	S8
	T9	Negative personal judgment	S9
Managerial	T10	Managerial clarification	S10
	T11	Response to managerial solicitation	S11
	T12	Initiation of managerial information	S12
	T13	Solicitation of managerial response	S13
Silence	T14	Silent covert activity	S14
	T15	Silent overt activity	S15
	X	Instructional nonfunctional behavior	X
	Y	Interaction separation designation	Y

The teacher's and pupil's activities videotaped during instruction are coded in accordance with these categories at 5 or 2.5 second intervals and the resulting data are then analyzed by computer (HITAC, M150).

Our first attempt was an analysis of student teaching of an elementary science lesson. As a result, we noticed that teacher trainees were not able to entice sufficient responses from their pupils nor were they able to get the pupils to give sufficient thought to the contents of the lesson. These problems are felt to be due to the fact that they have a number of deficiencies which are common to those teaching skills related to effective questioning techniques.

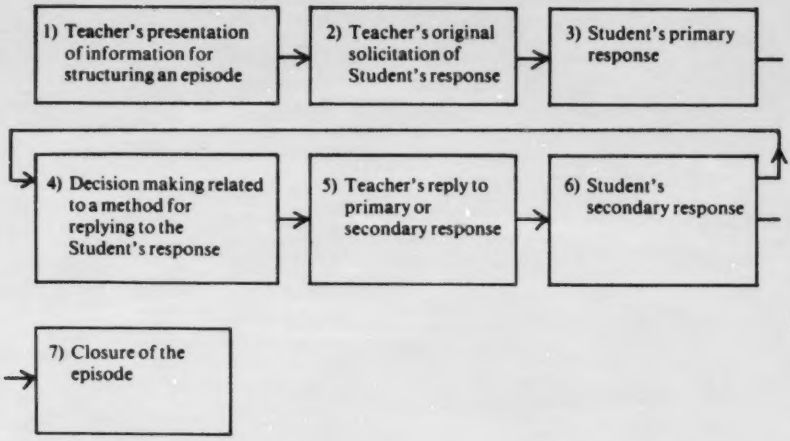
1) Teacher's presentation of information for structuring an episode
2) Teacher's original solicitation of Student's response
3) Student's primary response
4) Decision making related to a method for replying to the Student's response
5) Teacher's reply to primary or secondary response
6) Student's secondary response
7) Closure of the episode

FIGURE 1

DECISION MAKING MODEL IN A QUESTIONING PROCESS

In order to investigate this in further detail we developed a system of OSIA sub-categories which would clarify effective methods of questioning. We first referred to a number of past research works related to teaching behaviors. We then made a decision making model in a questioning process (Or an intent determination model for questioning techniques). The model is shown in Fig. 1 above.

A process from block 1 to block 7 in Fig. 1 indicates a floor talking or questioning process for developing an episode. Starting from block 1, as a result of a "teacher's original solicitation of student's response (question)," block 2, a student would make a "primary response," block 3. Many possibilities can be assumed regarding this primary response. It could be "I don't know." It could be an incomplete response, but one which the teacher assumes to be complete. It could be a response which indicates that the level of the question was too abstract and that other students might not have understood it. It could be one of a number of things. They way in which the teacher receives the response, the way in which he determines his own intentions towards the response, that is "decision making," block 4. The major factors which govern the teacher's "decision making" are shown in Table 2.

TABLE 2

THE MAJOR FACTORS WHICH GOVERN THE TEACHER'S "DECISION MAKING"

1) The category of the teacher's original question (block 2).
2) The category of the student's response (block 3 and 6).
3) The teacher's repertory of methods for coping with the response (The category of the teacher's behavior for copying with the response).

The teacher's "decision making" to cope with the student's response depends on the category of his original question. For example, if the teacher uses an open question (higher cognitive question) which asks for diverse answers, he needs to allow sufficient time to get some appropriate answers expected by him. It may be said that the category of the teacher's question depends on his teaching strategies for the questioning process.

In order to clarify the relationships between various types of original questions by the teacher and the methods for coping with student responses (above 3), we divided the teacher's original questions into one of these three categories (Table 3).

TABLE 3

CATEGORIES OF ORIGINAL QUESTIONS

1) T4a ..... Higher order cognitive questions
2) T4b ..... Lower order cognitive questions
3) T4d ..... Other types of questions

Sub-category T4a includes analysis, synthesis, and evaluation questions. The biggest difference between sub-categories T4a and T4b is, that for T4a question the respondent must think for himself and construct the response himself, while for T4b questions he may be able to reply using knowledge which he has memorized and understood. An example of a T4b question would be, "Where is the Japanese National Diet Building?" In comparison with their frequency of asking T4b questions, student teachers ask relatively few T4a category questions. Most of the questions coded T4d are requests seeking consent or agreement of some kind.

The second factor, 2) in Table 2, can be divided into further two factors. One of them is "the response expected by the teacher and standards upon which his expectations are based." Another one is "how the response is received based upon those standards."

Some student teachers do not have clear "standards," while others may have standards which are too high for their students' level of intellectual development. Again, there are many possibilities. Because of that, the next factor is "how the response is received based upon those standards". For

example, the teacher may not realize that with proper guidance an incomplete student response could possibly be developed into a complete one. Or, possibly the teacher may not realize from a student's response that his original question was not actually correctly understood. Also, if the teacher holds only simple standards of "correct/incorrect answer," it may be that he will not realize that, in regards to a response he has assumed to be incorrect, with proper guidance it would be possible to lead the students' ways of thinking towards the correct answer.

TABLE 4

CATEGORIES OF STUDENT'S RESPONSES

1) S2a	Responses requiring clarification
2) S2b	Responses which may be accepted "as are"
3) S2c	Clearly incorrect responses
4) S2d	Other responses

Based upon those reasons described above, the students' responses were divided into four categories (Table 4). Basically, these divide the responses into "acceptable," "acceptable with clarification," "not acceptable" and "others."

One reason why student teachers are often not able to cope effectively with a response is that their "repertory of methods for coping with the student's response" (the third factor in Table 2) is extremely limited. Based upon the information we have collected through our own research and reviewing other research related to instructional behaviors, we prepared a list of "response coping behaviors" and each item a sub-category of the OSIA category system (Table 5, see next page).

The first of these, "pausing," (Code T14a) indicates giving the students time to thoroughly think over. For example, a question involving higher powers of cognition. Another instance of a pause would be when a number of students raise their hands but the teacher delays calling upon someone in order to let other students think about the question a little longer. For the appraisal behaviors, we used OSIA categories T5 through T9 just as they are (See Table 1).

TABLE 5

TEACHER'S BEHAVIORS FOR COPING WITH STUDENT RESPONSE

1) Pausing	T14a
2) Appraisal behaviors	T5-T9
3) Clarification Behaviors	
a. Clarifying the content/intent of the teacher's questions	$T1a_1$
b. Clarifying the content of the student's response	$T1a_2$
c. prompting	T1b
d. refocusing	T1c
e. other type of clarification	T1d
4) Secondary solicitation behaviors	
a. Modified question	T4e
b. Repeating the question	$T4f_1$
c. Extending the question	$T4f_2$
d. Calling upon the first student	$T4g_1$
e. Calling upon another student	$T4g_2$
f. Solicitation of comments regarding a student's response	$T4h_1$
g. Directing group discussion	$T4h_2$

There are many behavior variables for effective questioning, however, from the findings of past research works related to teaching behaviors we realized that the important variable would be the way in which the teacher clarifies the student's response, that is, how to select a specific appropriate clarification behavior (from $T1a_1$ through T1d) responding to the instructional situation. Code $T1a_1$ includes such things as, based upon the student's response, the teacher realizes that the student did not fully understand the question and therefore he clarifies it, or, when the teacher realizes that the student misunderstood his intent of the questioning and then he talks to the student in order to orientate the response. It often happens that the teacher realizes that the other students have not understood the first student's response he clarifies it in an attempt to equalize the class's level of thinking. Code $T1a_2$ is the category in these cases. Many other examples could be given. Usually this kind of clarification is done by asking another question.

Code T1b, "prompting," could include, for example, the teacher's prompting of a student for the purpose of guiding the student from an incomplete response to the anticipated response. For some incomplete response, an effective method of prompting is to ask the student for the reasons for his answer. Code T1c, "refocusing," includes the seeking of another example within the same category as the student's first response or enticing of the student into thinking about his response from a different point of view.

"Solicitation of response," code T4 in the OSIA category system (see Table 1) include question, direction, command and so on. "Secondary solicitation behaviors," 4) in Table 4, is one of the response coping behaviors in questioning process. Though most "clarification behaviors," code T1, also take a form of asking question, we decided to assign them another codes (from $T1a_1$ through T1d) than the codes of "primary and secondary

solicitation." Subsequently we will discuss individual "secondary solicitation" behavior.

Code T4e is indicated when, from the student's response, the teacher realizes that this question was not complete or that it was difficult for the student to understand, so he therefore corrects and re-states his own question.

"Repeating the question," code $T4f_1$ is used when there is no response from the student or the response is incorrect. Since this is simply repeating of the original question it usually is not very effective.

Code $T4f_2$, "extending the question," is when the teacher determines that the student's response wasn't complete and he therefore seeks a further response from another student. As for codes $T4f_1$ and $T4f_2$, it is necessary to use the latter more frequently than the former in order to widen the distribution of the student's answer or to get more responses from the students. For this purpose, it is necessary to devise methods to make the students think about the original question from a number of differing points of view.

Code $T4h_1$ is behavior which requests other students modify the first student's response. Code $T4h_2$ is a method for coping when the teacher determines that the anticipated response cannot be immediately drawn out of the students.

Up to now we videotaped about 180 student teachings and we analyzed them by means of the sub-category system described above. We will discuss the results of the analysis in the next section.

Characteristics and Problems of Student's Teaching Skills for Effective Questioning

Fig. 2 (see next page) shows a student teaching flow chart which was prepared by using the sub-category system to analyze the student teacher's and the pupils' behaviors. The vertical axis indicates the various categories used in the analysis. The horizontal axis indicates the passage of time, the total length of this lesson segment being five minutes. Each asterick indicates five seconds, while each asterick with an over-dot indicates two and one-half seconds. Several frequently found inappropriate student teacher behavior patterns are shown in this instruction segment. For example, please notice the flow of behaviors between two minutes and 55 seconds and five minutes and 25 seconds.

Because the student teacher was entering a new episode in his instruction at two minutes and 55 seconds into his lesson, he spent two seconds presenting information for structuring the lesson (Code T3a). He then wrote the main points on the blackboard. This is shown under Code T15. The teacher then spent 15 seconds asking questions of higher order cognitive value (Code T4a). The student's reaction was a five second pause (Code T14a), after which the teacher repeated the question (Code $T4f_1$). There was another five seconds pause on the part of the student (Code T14a). The teacher again called upon his first student (Code $T4g_1$), following which the student spent 20 seconds giving a response which required clarification (Code S2a). Code S6 is a remark by another student in the class indicating agreement with the first student's answer. The student teacher simply accepted the answer (Code T7) and wrote it on the board (Code T15). If it had been an experienced teacher, at this point the teacher would have sought clarification of the answer through further

questioning. But this student teacher had not received any training nor lectures at the university regarding the importance of clarification activities. He therefore repeated "Is there anything else?" twice (Code $T4f_2$). After permitting the students sufficient time (Code T14a), he then twice called upon other students (Code $T4g_2$). Since he was ultimately unable to elicit a response from the class he gave up and presented information closing the episode.

We can find out several characteristic patterns of the student teaching by means of comparing the student's flow chart with a veteran teacher's one shown in Fig. 3.

At a glance we can notice that the amplitude of the student teacher's flow lines is far smaller and simpler than the veteran teacher's one. It is one of the reasons that there is no clarification behavior (Code from $T1a_1$ through T1d) in the episode of the student teaching. Consequently he was able to elicit only one response in spite of calling upon three students (Code $T4g_1$ and $T4g_2$) and trying to extend his primary question (Code $T4f_2$) two times. Generally these flow chart patterns can be detected in most of the student teaching. While the veteran teacher was able to elicit seven responses for his primary question in the flow of an episode between one minute and 5 seconds and four minutes and 40 seconds (see Fig. 3).

These differences between the student teacher and the veteran teacher in teaching skills can be also detected in Table 6. The large differences in percentage of verbal behaviors between the student teacher and 21 veteran teachers' average can be found out in clarification behaviors (Code from $T1a_1$ through T1d), initiation behaviors of information (Code from T3a through T3c), and pupil response (Code from S2a through S2d). As the results of close examination on these data, we found some indicators of teaching skills for effective questioning as follows:

1. **Indicator of "response coping behaviors"**: This indicator can be introduced from the following formula;

   indicator of "response coping behaviors"

   $$= \frac{\text{time used for "response coping behaviors"}}{\text{total time used for all teaching behaviors}} \times 100(\%)$$

   This percentage of the student teacher in Table 6 is 29.5%, while the average of 21 veteran teachers is 40.5%. We think that one of the reasons for this large difference would be due to a shortcoming for the training in our University.

2. **Average times for "redirection"**: The major purpose of "redirection" (calling upon another student, Code $T4g_2$) is to increase the amount of pupil participation in the class. To use redirection effectively, teachers must face and solve two problems.

   The first is choosing the type of question to be used. A good type is one that offers a number of alternative answers in calling for a set of related facts. Another effective type of redirection question is one involving differences of opinion.

   The second problem many teachers must solve in order to use redirection effectively is to correct their tendency to repeat or rephrase the question for each pupil in a redirection sequence. Both are very difficult problems for student teachers.

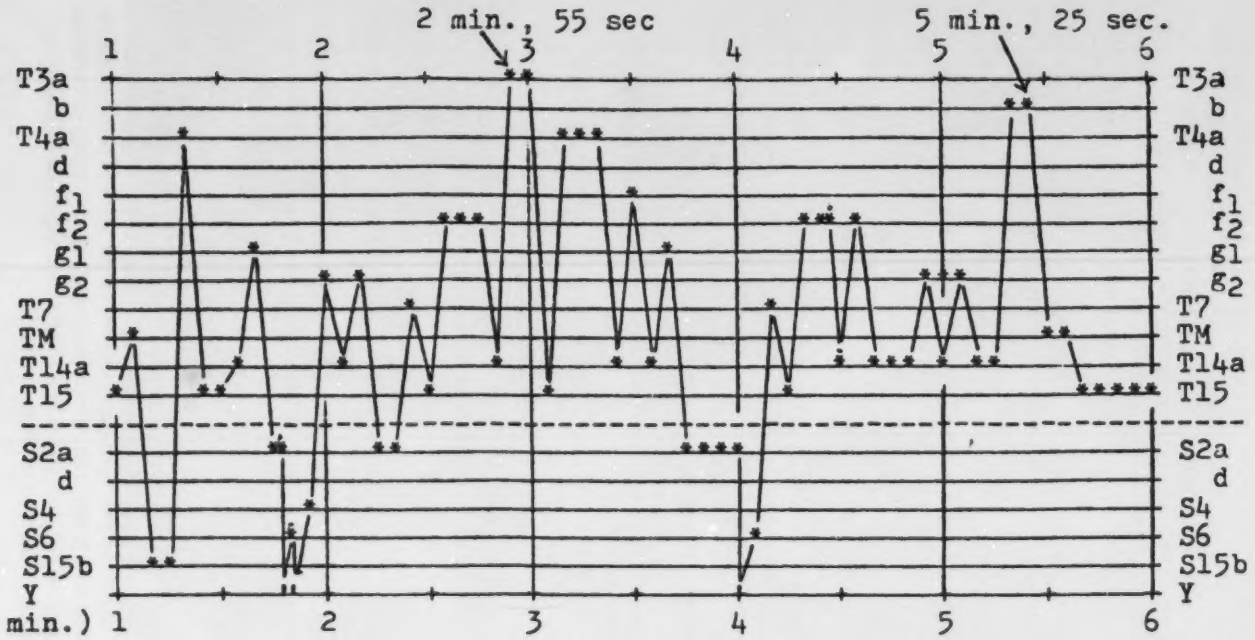

FIGURE 2

FLOW CHART OF A STUDENT TEACHER'S TEACHING (THIRD GRADE ELEMENTARY SCIENCE LESSON "MAGNETS")

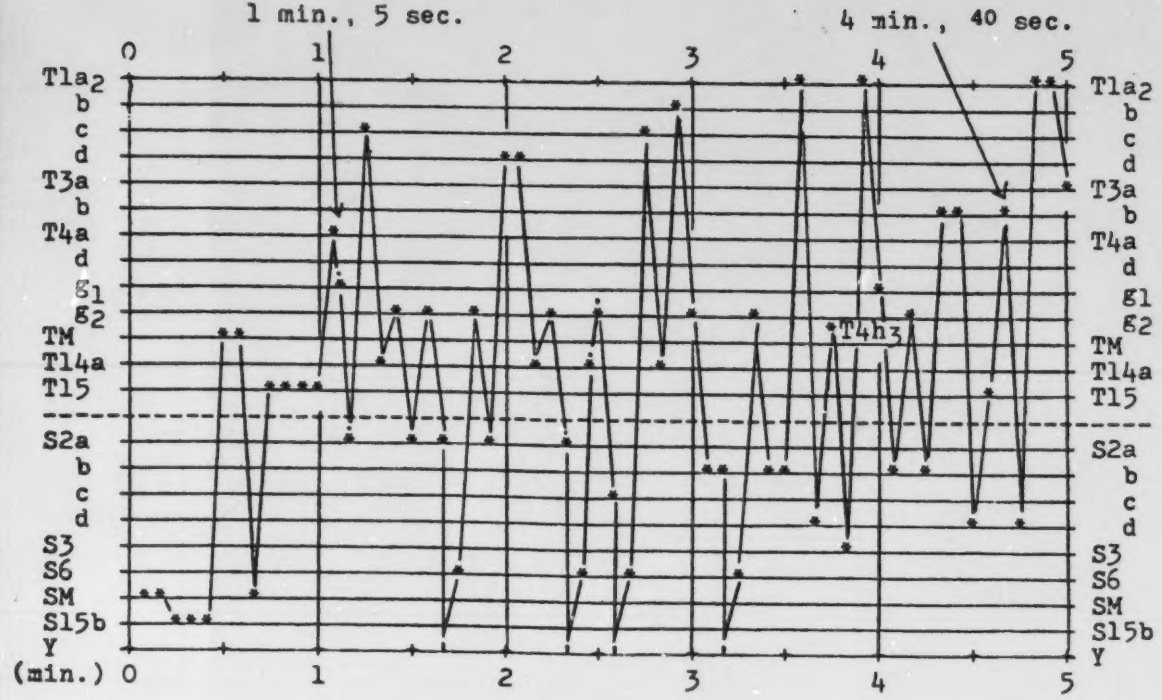

FIGURE 3

FLOW CHART OF A VETERAN TEACHER'S TEACHING

TABLE 6

RESULTS OF INSTRUCTIONAL ANALYSIS FOR A STUDENT TEACHING

Code	Freq.		Time (sec.)		Avg. Length (sec.)		%-age of Verbal Activity	Avg. %-age of Veteran Teachers
T1a 2 b	5 3	8	17.5 12.5	30.0	3.5 4.2	3.8	2.5%	13.6%
T2		1		2.5		2.5	0.2	1.2
T3a b c	18 8 7	33	167.5 95.0 32.5	295.0	9.3 11.9 4.6	8.9	25.1	11.5
T4a b d f 1 f 2 g 1 g 2 h 3	5 7 6 3 10 5 16 2	54	35.0 30.0 20.0 15.0 55.0 20.0 70.0 10.0	255.0	7.0 4.3 3.3 5.0 5.5 4.0 4.4 5.0	4.7	21.7	19.4
T7		8		30.0		3.8	2.5	7.9
TM		23		150.0		6.5	12.7	10.4
T14a T15	20 39	59	102.5 230.0	332.5	5.1 5.9	5.6	—	—
Total		186 (127)		1095. (762.5)		5.9 (6.0)	64.8	63.8
S2a b d	13 9 6	28	140.0 50.0 20.0	210.0	10.8 5.6 3.3	7.5	17.8	23.4
S1 S3 S4 S6	6 13 14 10	43	27.5 50.0 55.0 40.0	172.5	4.6 3.8 3.9 4.0	4.0	14.6	11.3
SM		7		32.5		4.6	2.8	1.5
S15a b c	3 13 2	18	90.0 545.0 60.0	695.0	30.0 41.9 30.0	38.6	—	—
Total		98 (78)		1110.0 (415.0)		11.6 (5.3)	35.2	36.2
Grand Total		282 (205)		2205.0 (1177.5)		7.8 (5.7)	100.0	100.0

*Numerical values in parentheses indicate ones related to verbal activities.

For the reason described above, the average in the number of times for redirection in a lesson is an important indicator of effective questioning. We can get this indicator by the following formula:

$$\text{average times of redirection} = \frac{\text{the number of times for Code T4g}_2}{\text{the number of times for Code T4g}_1} \text{ (times)}$$

The average times of the student teacher in Table 6 is 3.2 times and yet he was unable to elicit anticipated response in many cases, while the average of veteran teachers is 5.3 times.

3. **Average length of pupil response:** The average length of pupil response in a lesson is also a valuable indicator for effective questioning as W.R. Borg and his colleagues (the staff of Far West Laboratory for Educational Research and Development) point out in their "Minicourse."

   The average length in the student teaching is 7.5 seconds, but this is far longer than the average of student teachers, that is, 4.1 seconds. While the average of veteran teacher is 9.8 seconds. We think that this difference between student teachers and veteran teachers would be due to how to use response coping behaviors."

Development of Instructional Simulator by Protocol Approach

Based upon our analysis of the existing teaching skills, as we described above, we have developed a system for training in teaching skills by means of protocol approach. This training can be done prior to the student teacher's undergoing actual practical teaching. An outline of our training system is shown in Fig. 4. (See next page.)

This system can accommodate up to 80 students at a time. It uses a color video projector and a large screen for presenting instructional scenes. The random access VTR equipment shown on the right consists of twenty videotape recorders. Various instructional scenes including both positive and negative modelling of teaching skills, pupil responses, and feedback information are pre-recorded and placed on the VTR equipment. These various instructional scenes can be projected upon the screen in random order, depending upon the progress of the computerized program.

The student teacher's responses are collected together using individual response buttons and an answer checker (or response analyzer as it is sometimes called). The response buttons are shown in Fig. 5.

As you can see, they permit a total of eight responses, X, Y, Z, plus A through E. This makes it possible to construct a single problem with eight possible answers, or it is possible to divide the responses into two stages. For example, the students could be shown three different instructional scenes, X, Y, Z, and asked which of the three they think is

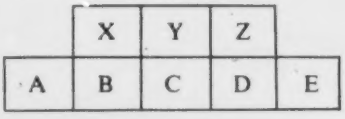

FIGURE 5

RESPONSE BUTTON PANEL

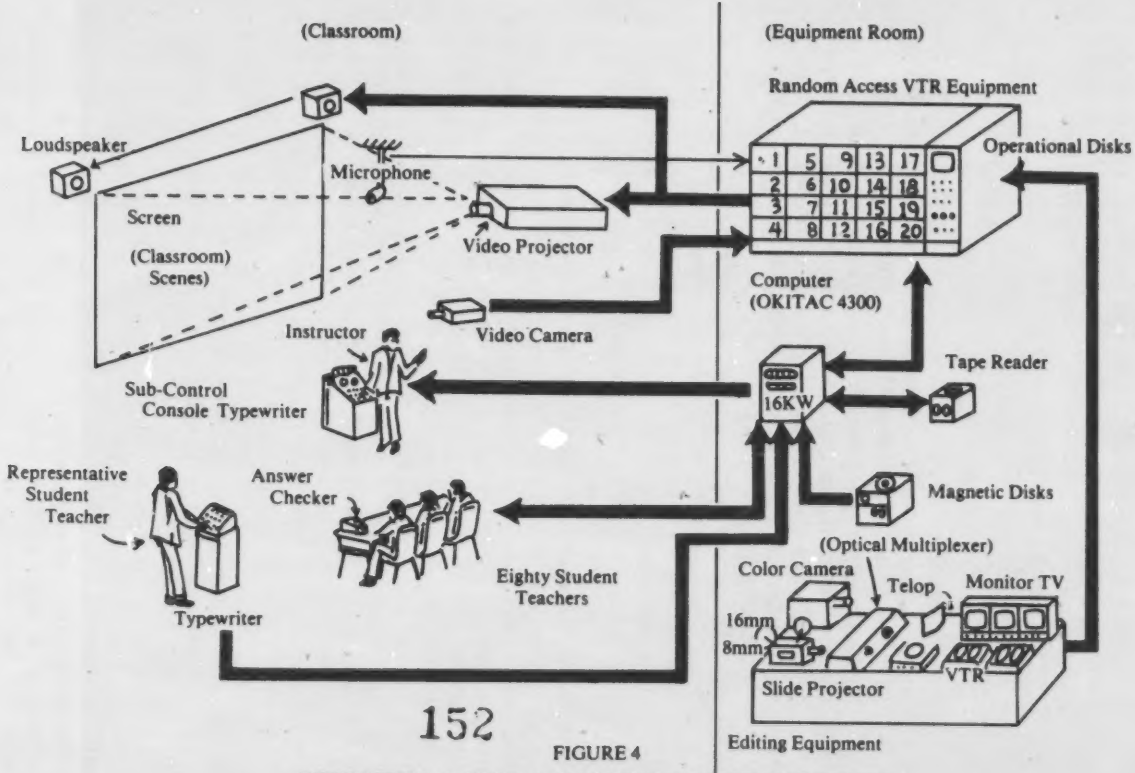

FIGURE 4

INSTRUCTIONAL SIMULATOR (TOKYO GAKUGEI UNIVERSITY)

the most appropriate for the situation. They could then be asked to indicate what they consider to be the appropriate reasons for their decision a second list of five choices, A through E.

The result of each individual's answers and the totals can be processed through the computer and immediately outputted through the line-printer. As shown in Fig. 4, we use a mini-computer with a storage capacity of 16K words. This system, incidentally, can be operated manually as well as automatically through the computer.

We are presently making progress in using this system for development and testing of programs in the three areas as follows.

1) Lectures on important teaching skills related teaching concepts.
2) Training in locating teaching skills related instructional problems.
3) Training in "decision making" regarding teaching related instruction.

For the first of these, "lectures on important teaching skills related teaching concepts," our system permits presentation of videotaped scenes from actual instructional situations; for example, a segment of model instruction regarding mutual interactions which presents the concepts of those interactions for which are involved in the teaching learning process.

For 2), "training in locating teaching skills related instructional problems," a program is now being prepared which will permit the student teachers to discover for themselves from videotaped instructional scenes those teaching skills considered as desirable from the viewpoint of the effects of the instruction.

And, we have already developed some programs for the third of these, "training in decision making regarding teaching skills related instruction." This is the decision making model for questioning techniques which I discussed earlier.

This instructional simulator system can also be used for role-playing, just as is done in microteaching. For example, first videotape giving a teacher's original question and a student's first response is shown. Then one of the student teachers is selected to actually decide upon a method for coping with the student's response. The student teacher to do this is indicated by the representative student teacher shown on the left side of Fig. 4. At the same time, five or six student teachers sitting in the front row could play the roles of regular students. The representative student teacher would direct his actions towards this group while the video camera could record the scene for immediate follow-up projection on the screen making it possible for all the students to consider the pros and cons of the instructional activities just witnessed. The typewriter shown in Fig. 4 can be used for answering comments made in regard to the representative student teacher's instructional behaviors.

These various programs are presently still not out of the experimental stage and a sufficient number of follow-up surveys regarding their effects have yet to be conducted. However, we are aiming towards and still striving for achieving our anticipated results.

12

INSTRUCTIONAL PROBLEMS AND METHODS OR STRATEGIES USED FOR OVERCOMING THEM

by
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Abstract:

Instructional problems encountered in teaching experimental science to University students in India are identified. The main difficulty in providing simultaneous instruction on a theory and its experimental verification is solved by planning a set of demonstration experiments and slides depicting the experiments and the results.

A new method of exhibiting experiments in electronics to a class of about fifty students, designed and developed at I.I.T., Madras, with COSTED assistance, is discussed. A 'do-it-yourself' kit for electronics learning is also discussed.

Introduction

It has been rightly said that the destiny of a nation is shaped in its classrooms. India has been trying to cope up with the problem of imparting instruction in science and technology in the context of the tremendous knowledge explosion taking place in recent years. The problems encountered need to be identified so that the science of learning and the art of teaching can be tailored to overcome them.

Instructional Problems in University Teaching

By and large the classroom instruction in Indian Universities has been in the form of lectures with the black board and the chalk piece as the main equipment. Faculty supervision is in the form of monthly tests and examinations at semester ends, and help evaluation of students. The laboratory course consists of a set of experiments performed by the students in a cyclic order over the entire semester. There has been criticism that this system is unsatisfactory, if for no other reason than that the experiments designed to support a theory are often performed first in the laboratory while the theory itself is learnt later. The other criticism often voiced is that in the lecture-type instruction, the student is a passive partner and so the system does not ensure his response to the instruction material. A new type of criticism levelled by Shekawat[1] about Indian Universities is also worth mentioning. He says "Most teachers, even if they have travelled widely in the west, fail to ap-

preciate the conceptual import of science, they reward memorizing, they dread questioning and fail to communicate to the student the conceptual essence of science"[4]. While we do not seek to deal with this psychological problem, we have made some attempts to overcome the other drawbacks in the instructional strategy.

Remedial Measures

The main difficulty in running a science curriculum lies in making the theory and its experimental verification contemporaneous. As mentioned in the earlier section, a laboratory course designed for a class of about 50 students, which is the unit in most Indian Universities at the undergraduate classes, cannot overcome this problem. One remedy for this is that the experiment is performed at the time of the lecture, by the teacher, in the lecture hall. This means that a set of qualitative and semi-quantitative experiments of the demonstration type, is a positive necessity for every course. Where the topic is of such a nature that an experimental demonstration of a theory is not possible, as for example in nuclear physics, slides depicting the standard experimental set up, the results of studies made by the actual workers etc., can be shown. When successful experiments are shown, even a teacher with a moderate ability of communication can achieve effectiveness in teaching.

The main aim of this paper is to indicate how these two programmes have been tried out in some selected branches of physics at the Indian Institute of Technology, Madras. The Physics Department participates in instructional programmes for undergraduates majoring in Engineering and to graduate students majoring in Physics and Engineering.

Teaching with the help of Slides

An experimental subject can be taught by supplementing the lecture with slides depicting the results of research workers. In fact, the curriculum can be summarized through a set of slides including experimental set ups, important results etc. Colour slides for instructional programmes in some branches of physics have been prepared under the COSTED programme.

Demonstration Experiments

Prof. R.W. Pohl of Gottingen University, Germany was one of the pioneers in teaching physics through demonstration experiments. The Indian Institute of Technology, Madras which was established in 1959 with collaboration of the Federal Republic of Germany, had the benefit of the use of the experiments designed by Pohl for teaching mechanics, electricity and optics at undergraduates level. With innovations made at the I.I.T., to suit our curricula, they have been in use over the last twenty years.

Electronics Teaching

Design of classroom demonstration experiments here poses certain peculiar problems. Unlike in the general physics experiments, the small sized electronic devices are not visible to the audience when a circuit is made out in the class. All that can possibly be shown is the effect of a certain circuit in the form of the deflection of the pointer of a meter which can be projected on a

wall. This does not give the satisfaction of displaying the experiment. We have devised the following method of demonstrating electronics experiments (with discrete solid state devices).

The main difficulty a teacher has in explaining the principles of the working of electronic devices is in the identification of components. The circuit symbols have no resemblance to the actual components they represent. When the student goes to the laboratory he is therefore unable to choose even a resistor without the constant help of an instructor. We have combined in our design, to exhibit the circuit symbol and the component in the experiments demonstrated by us.

Exhibition of Components to the Class

1. **Devices**

   In keeping with our concept of taking along hand in hand the theory and practicals, the teacher should be able to give an idea of the size, shape and constructional details of the electronic devices. With this end in view we encased the original (working) devices in enlarged dummy structures of shapes (and details) same as those of the devices but magnified (seven times in all cases) so that a class of fifty can clearly register the characteristic features of these devices. The students will thus have no difficulty in recognising them when they go to their laboratory sessions. These models which have also the original devices inside the casings, can be used in circuits. They are easily dismantled to remove the devices that go out of order.

2. **Experimental Circuit Board**

   A large sized (2m × 2m) sunmica board is used for wiring the different circuits. A wiring pattern suitable for about thirty experiments has been designed and permanently made on the board with silver coated copper strips with sockets at their ends. This enables the teacher to plug in the appropriate devices and circuit elements for completing the circuit.

   A board such as this is bound to confuse the student because of many surplus sockets when a particular experiment is demonstrated. To overcome this, a set of five masking sheets (of opaque plastic) are prepared, with slots made at appropriate positions to make only those portions of the wiring pattern needed for the particular set of experiments visible, while covering the others. This greatly simplifies the pattern and retains the versatility of the circuit board in accommodating a variety of experiments.

3. **Circuit Symbols**

   An additional feature of this kit is that the components are not plugged into the relevant sockets to begin with. The teacher first forms the circuit by plugging in a set of 'perspex' mounts on which the appropriate conventional symbols are screen printed. After forming the circuits with these symbols, he can plug in the components (encased in dummy housings) which contain 4 mm. pins that could be appropriately plugged into the sockets. The kit goes along with the usual peripheral equipment like the meters, CRO and power supplies.

Learning Aid in electronics

While the above aid is meant for a large audience and is handled by a knowledgeable teacher, the one that we present here is meant more as a learning aid in some sort of a self study programme for a beginner. The emphasis obviously shifts towards qualitative rather than quantitative projection of the subject.

The construction of the wiring pattern and the choice of the masking sheets and the preparation of circuits follow the same pattern except that the board is small. The components (without dummy casings) are mounted by soldering them to pins attached to perspex sheets. The circuit symbol of the component is printed on the sheet.

This kit along with power supplies and the meters where necessary, is enclosed in a brief case and is portable. A programmed write up for the experiments with figures, circuit lay out and questions has been framed on the pattern of 'linear programming' in Skinner's terminology[2]. Programmed courses have been reported to be effective in India for teaching science[3]. The linear programming, however, is independent of the learner's response and it is hoped to frame a branching programme to make it response oriented.

Conclusion

Lectures supplemented by slides and demonstration experiments are clearly one of the effective solutions to overcome the problem of providing simultaneous instruction in theory and practice of experimental subjects.

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BACKGROUND PAPERS

1. SELECTIVE REVIEW OF RESEARCH STUDIES SHOWING MEDIA EFFECTIVENESS: A PRIMER FOR MEDIA DIRECTORS.

by

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2. THE TEACHING-LEARNING PROCESS IN POLITICAL SCIENCE

by

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Professor of Government and Public Administration and Dean of the College of Graduate Studies, Nanyang University, Singapore

3. AN EXPERIMENT IN ACTIVE TEACHING AND LEARNING IN PHYSIOLOGY

by

Hashim Effendi and Yasmeiny Yazir
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School of Medicine
University of North Sumatra, Medan, Indonesia

PAPERS ON SUPPORTIVE INFRASTRUCTURE, ACADEMIC STAFF TRAINING AND THE USE OF EDUCATIONAL TECHNOLOGY FOR DEVELOPING EFFECTIVE TEACHING-LEARNING PROCESS

13

THE ROLE OF INSTRUCTIONAL TECHNOLOGY IN HIGHER EDUCATION INSTITUTIONS IN THE UNITED STATES

by
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Abstract:

Today traditional but largely untested assumptions concerning higher education instructional practices are being challenged as a result of significant national and international changes.

Such changes involve: (1) increasing numbers and differing characteristics of students seeking higher education; (2) a questioning of the "sacrosanct" character of traditional college and university teaching which often hasn't measured up to the needs of modern-day students; (3) the growing need for new types of educational programs for re-training, continuing education, external degrees, etc; and (4) the diminishing economic base which demands greater efficiency and effectiveness in all aspects of the educational process and suggests a significant examination of the potential role of instructional technology in higher education.

The development of instructional technology is traced, beginning at the time when teachers looked to each emerging educational innovation as a "panacea" for all instructional needs. Today, through extensive classroom experimentation and numerous "comparative effectiveness" investigations, educators generally accept instructional technology, when carefully selected and wisely utilized, as having the potential of enriching the curriculum and supplementing teaching. Unfortunately, too often their use is supplementary, and the array of media and machines is nearly always under the teachers' control. Mediated teacher systems involving programmed instruction, self-instructed modules, audio-tutorial laboratories and computer-assisted instruction are still in pioneering stages in most colleges and universities. Gradually, though, the pieces of a rich learning environment (products, people and processes) are beginning to be seen and treated as interrelated parts of a whole. Slowly, instructors are re-evaluating instructional technology as a significant "process" rather than as pieces of hardware-audio-visual aids! Resistance to change is a persistant challenge and major obstacle to faculty acceptance of newer technologies in higher education.

The "systems approach" which has proven itself in military, government and industrial settings is now being seriously tried in all manner of educational arenas. In U.S. higher education, the scientific and health science areas have received perhaps the greatest concentrated experimentation in applying a "systems approach" to curricula re-design. Samuel Postlethwaite's pioneering effort in re-designing his biology course at Purdue University illustrates how instructional technology, involving both a systematic or "process" approach and the essential hardware, can produce significant improvements in student motivation and learning. Research results documenting the effects of similar systematic "instructional development" efforts in re-designing the U.S. Naval Academy's economics course and the basic Earth Science course at the University of Wisconsin — Eau Claire are presented by means of slides.

Various organizational arrangements for providing faculty, students and staff convenient access to the full range of learning resource services, equipment and facilities are explored. Current missions, departmental functions, and resources available through the system-wide Audio-Visual Center and the School of Education's Media Services Program at Indiana University are visually presented. Comparisons are made with similar outstanding media programs at Michigan State University, Syracuse University and Florida State University. The Indiana

University Department of Nursing Instructional Communication and Educational Resources (NICER) illustrates the extensive organizational and staffing provisions within four areas: audio-visual support; instructional design/evaluation; operations; and media production. This department supplies audio-visual support for 150 nursing faculty and 1700 nursing students. The sophomore year nursing curriculum has been mediated for self-paced instruction in its entirety through the combined efforts of NICER and the faculty.

Faculty development, instructional development, and organizational development activities are needed if instructional technology is to make a serious impact in higher education. Academic staff training approaches employed by selected U.S. colleges and universities are briefly described and considered. Michigan State University's integrated organisation of its Educational Development Program and Instructional Development and Telecommunication Service serve as a model to other colleges and universities in the United States desiring to undertake systematic curriculum development.

Educators are challenged to utilize the knowledge and theoretical constructs already acquired when applying a systematic or "process" approach to educational technology. Only time will reveal whether or not we can capitalize on and refine current efforts to improve teaching and learning.

Today traditional but largely untested assumptions concerning higher education are undergoing serious re-examination as a result of significant national and international changes.

Some of these changes involve:

1. The increasing numbers and differing characteristics of students seeking higher education today;
2. The questioning of the "sacrosanct" character of college and university teaching, which often is proving inadequate to the changing national and global needs of students;
3. The growing need for new higher education programs which deal with continuing education, professional and vocational retraining, external degrees, and others;
4. The diminishing economic base for education resulting in demands for greater efficiency and effectiveness in all aspects of program development and administration in higher education, and explorations of new uses of educational technology.

The organizers of this conference on the Teaching-Learning Process in Universities have wisely focused a significant part of the conference on the first three of these topics.

During the remaining days of the conference we will have an opportunity to consider the role instructional technology can play in contributing to the efficiency (doing things right) and the effectiveness (doing the right things) of learners, seeking higher education for whatever purpose.

In the early 1970's, the U.S. Congress appointed a Commission on Instructional Technology to concern themselves with "the whole gamut of instructional technology — old, new and future; mechanical and electronic; automated and cybernated; from innovations in print to computers; from classrooms to multi-media centers." (18: preface)

After two years of study and the expenditure of over two billion dollars, the distinguished members of this Commission concluded:

> In the conviction that technology can make education more productive, individual, and powerful, make learning more immediate, give instruction a more scientific base, and make access to education more

> equal, the nation should increase its investment in instructional technology, thereby upgrading the quality of education, and, ultimately, the quality of individuals' lives and of society generally. (19:10)

Those of us attending this conference are probably of this same opinion — convinced that technology can provide resources and services which are integral, not peripheral, to the conducting of systematic college teaching and learning. Perhaps most of you have had these convictions reinforced by research reports and summaries similar to these reported by Allen (1), Campeau (4), Moldstad (16), and others.

The Changing Role of Instructional Technology

Historically, teachers' evaluations of the contributions of instructional technology to the instructional process have undergone interesting phases. Starting with the blackboard, each new teaching device was initially regarded as an "aid" to the teacher. As instructional films, slides, audio-tapes, and more recently programmed instruction and television appeared on the horizon, each in turn was heralded as the "panacea" destined to solve all educators' problems.

Even as astute an individual as Thomas A. Edison overestimated the value of the educational film. Shortly after the invention of the motion picture, Edison predicted:

> The only textbooks needed will be for the teacher's own use. Films will serve as guideposts to these teacher-instruction books, not the books as guides to the films. Pupils will learn from films everything there is in every grade from the lowest to the highest..... Films are inevitable as practically the sole teaching method. (5:183)

Perhaps Mr. Edison was over-optimistic because it was his own invention he was talking about!

John W. Gustad, Chairman of the NEA Committee on Teaching of the Association for Higher Education, summarized this point well:

> At one time or another, radio, motion pictures, filmstrips, TV, language labs, and teaching machines have been hailed as the saviors of education. So have large classes, small classes, seminars, tutorials, independent study, years abroad, work-study programs, midwinter reading periods, and year-round operation. None of these is either as bad as detractors assert or as good as zealots claim. Lacking an adequate theoretical framework in which to place these innovations, the pendulum continues to swing wildly from euphoria to cynicism. (11:38)

Fortunately, many teachers knew from experience that there would be no one "panacea." Most soon learned to evaluate each medium and its accompanying hardware in terms of its effectiveness in promoting their students' learning.

Hundreds of research studies attest to the significantly greater learning resulting when appropriate media were integrated into the instructional program in higher education.

Due to limits of time, let me cite only one study to illustrate.

OVERHEAD TRANSPARENCY: Chance's study of use of 10 × 10 overheads in teaching Descriptive Geometry at University of Texas (15:392)

Chance and his university colleagues found ample evidence to show the value of these specially prepared overhead transparencies. Thus, the early role definitions of "instructional technology" grew out of such teachers' realization and acceptance that media born of the communications revolution could serve a very useful purpose when used alongside the teacher, the textbook and blackboard. Such definitions frequently consisted of an enumeration of specific teaching materials which did not depend primarily upon verbal forms of communication.

Emergence of the "Systems Approach"

During the late fifties and sixties, students began to tell educators something we should have known all along — that much of what was going under the guise of "teaching" had little relation to active "learning."

Confucius said it this way years ago:

I hear and I forget
I see and I remember
I do and I understand

"Up to that time, I had thought that education was the delivery of what you know. Now, I'm convinced that education isn't a delivery system at all. Learning must be done by the learner. He must be involved." (13:8)

The speaker was Sam N. Postlethwait, professor of biology at Purdue University, and the "up to that time" of his reminiscence refers to his teaching days prior to 1961 when he developed the audio-tutorial system of teaching in an effort to help Indiana farm youth to understand difficult biology concepts not as masses of 200-300 freshmen students but as *individual* students with their own special problems and specific learning rates.

Dr. Postlethwait began to collaborate with colleagues in the School of Education's department of audio-visual aids in the production of taped lectures, color photographs, biology specimens, film loops, charts — the whole gamut of audio-visual aids — in structuring an optimum learning environment.

The success of his audio-tutorial laboratory was soon widely acclaimed by students and colleagues alike. Visiting educators came away convinced that the real potential of instructional technology lay not only in the use of individual hardware or software items as aids to teachers but in their skillful use as parts of a planned system where they were selected and utilized when they were most educationally appropriate and psychologically needed by learners.

Today, similar audio-tutorial laboratories are commonplace not only in college and high school science areas but in language, English, and many other content areas.

Due to the work of pioneers like Postlethwait, Skinner, Crowder, Gagne, Keller, Glazer, White and many others, the study of the role of instructional technology has taken on a much broader perspective. Scholars and prestigious commissions studying the educational impact of newer

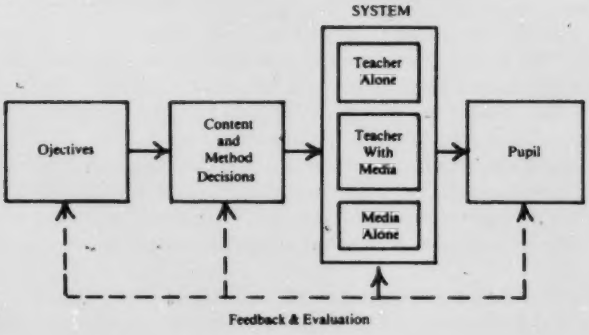
technology now almost universally accept the definition adopted by the Commission on Instructional Technology in its reports to the President and the U.S. Congress.

> Instructional technology is more than the sum of its parts. It is a systematic way of designing, carrying out, and evaluating the total process of learning and teaching in terms of specific objectives, based on research in human learning and communication, and employing a combination of human and non-human resources to bring about more effective instruction..... (19:7)

As the above definition implies, the situation of the individual teacher making all the content, method, and learning-objectives decisions and then closing her classroom door and presenting her message to passive students with only a textbook, chalkboard and occasional outdated map or chart to assist her must become a thing of the past.

Much of the encouragement for trying a "systems approach" in educational planning grew out of its record of success when used by the U.S. Armed Forces in World War II and in later successful uses in industrial planning and space exploration. Educators reasoned — if a "systems approach" is essential in placing a man on the moon, why shouldn't it be just as useful in planning a science or foreign language curriculum:

Such an approach was suggested by an audio-visual task force assembled by the NEA Division of Audio-visual Instructional Service in Washington, D.C. as early as 1962, and is diagramed below with their permission. (17)



Such a system consists of a scientific ordering and combining of teacher, content to be learned, media, and teaching strategies so as to provide optimum learning of agreed-upon objectives.

Notice that in this "system" there are times when the teacher alone can best lecture and/or interact with the student; there are other situations when the teacher using a map or globe, a picture set, or a film or filmstrip can most effectively assist the learner; and there are also special times when the teacher may suggest the learner interact directly with a specific medium, such as by studying a chart, viewing a sound-filmstrip or listening to a record.

Let's see only two examples of what effect such a learning system can have on college learners.

OVERHEAD
TRANSPARENCY: U.S. Navay Academy course — Economics — Micro and Macro (8)

OVERHEAD
TRANSPARENCY: Audio-tutorial system in basic Earth Science course, University of Wisconsin, Eau Claire (15:19)

After reviewing hundreds of "comparative media studies" where the effects of added stimuli involving instruction technology (media plus current practice) on student learning were compared with student learning resulting from conventional instruction where technology was either not used or used very sparingly, I feel there is significant evidence to justify the following claims when instructional technology is carefully selected and used.

1. Significantly greater learning often results when media are integrated into the traditional instructional program.
2. Equal amounts of learning are often accomplished in significantly less time using instructional technology.
3. Multimedia instructional programs based upon a "systems approach" frequently facilitate student learning more effectively than traditional instruction.
4. Multimedia and/or audio-tutorial instructional programs are usually preferred by students when compared with traditional instruction. (16:39)

Supportive Infrastructure for Facilitating Use of Educational Technology in American Universities

Resistance to Change — A Persistent Challenge

In general, American college and university professors have accepted the potential usefulness of instructional technology in the teaching-learning process in higher education. This is not to say that there are not numerous professors who view technology as a threat to the status quo and thus reject or at least are reluctant to use the new media.

Major Obstacles to Faculty Acceptance

As a special staff consultant for the Commission on Instructional Technology, Richard Hooper (14) sought to identify the major obstacles to the introduction of technology into education in the United States.

He found these major obstacles:

1. The inertia of the educational system itself to change and the fear of what comprehensive change might bring.
2. The difficulty of getting media incorporated and sanctioned as part of official curriculum decision-making with accompanying selection and media coordinating authority.
3. The lack of well designed "software" which meets specific teaching objectives.
4. The difficulty of providing the logistical system necessary to insure that hardware and software are readily accessible and easily used by teachers.

5. Attitudes of localism and parochialism which prevent individual school systems from admitting that instructional software developed elsewhere can have application and usefulness in the local setting.
6. The lack of required training of administrators and teachers in organization, curriculum integration, and use of educational technology.
7. The "poor" image of media people as solid educators and instructional developers.
8. The absence of a viable theory of learning and the inability of incorporating media research into either the design or production of instructional materials.

Two other major deterrents not mentioned by Hooper but frequently cited in the research literature are inadequate facilities for media utilization and inadequate budget to provide much needed media services. (10:68)

Admitting that the widespread incorporation of instructional technology in institutions of higher learning is desirable but fraught with difficulties, the remainder of this paper will: (1) describe how several outstanding college and unversity media programs are organized and staffed — what their major functions are — and how they facilitate the use of technology in instruction; and (2) what strategies are presently being tried to provide academic staff training in planning, selecting, producing and/or using newer media in order to assure that instructional technology will be utilized in the future in the most efficient (doing things right) and effective (doing right things) manner.

Basic Functions of Technological Communications Services in Higher Education in U.S.

By 1980 it is estimated that more than 11 million people will be enrolled in higher education institutions in the United States. Satisfying the many different objectives, learning aptitudes, cultural backgrounds, and varied educational experiences of these students will demand our best education planning and administrative know-how. I'm sure each of you here today has similar challenges!

Professors, students, and staff must be provided convenient access to the full range of learning resources services, equipment, and facilities. Included in some type of administrative organization must be (1) libraries, (2) museums, (3) technological communications services, (4) computer services and (5) the press.

OVERHEAD
TRANSPARENCY: A recommended organizational plan. (2:4)

This organizational plan is perhaps ideal with all five departments or centers under an overall Dean of Learning Resources and Services who in turn reports to a Vice President for Academic Affairs. However, it must be acknowledged that many renowned American universities provide most of these services but frequently under varying and sometimes less logical and integrative administrative arrangements. These particular arrangements are often simply due to historical exigency. However, I believe the important point is that such services are provided in an efficient and facilitative manner regardless of administrative organization.

Since I understand during this conference at the Universiti Sains Malaysia we are focusing on the use of newer educational technology, I would like to acknowledge the extreme importance of each of the five above-mentioned resource and service departments and then describe in greater detail the technological communication services as organized at the Audio-Visual Center on lthe Bloomington campus of Indiana University and at several other outstanding universities.

Current Functions and Resources of the I.U. Audio-Visual Center*

Currently, the I.U. Audio-Visual Center consists of a staff of 17 persons holding professorial appointments in the School of Education; 30 other administrative, professorial, and other academic personnel; 55 clerical, technical and service personnel; 64 graduate assistants and 76 hourly assistants.

OVERHEAD
TRANSPARENCY: Line and Staff Organizational Chart of the I.U. AV Center (see page 166)

Working with other learning resources programs throughout the Indiana University system, it is the mission of the Audio-Visual Center to assist the full range of academic and administrative clients in the planning, implementation and evaluation of strategies utilizing technological processes and products designed to contribute to the teaching/learning, research and public service activities of the University.

To carry out the instructional support objectives as well as the other objectives, the Audio-Visual Center is divided into four divisions.

Development and Special Projects

The Division of Development and Special Projects engages in a variety of functions including: (1) large course development projects, which involve complete redesign of a course or courses; (2) smaller projects involving development of units or special projects; (3) consulting with departments in areas of instructional policy planning for curriculum change, team teaching, etc.; (4) individual consultation regarding teaching style and assorted classroom activities.

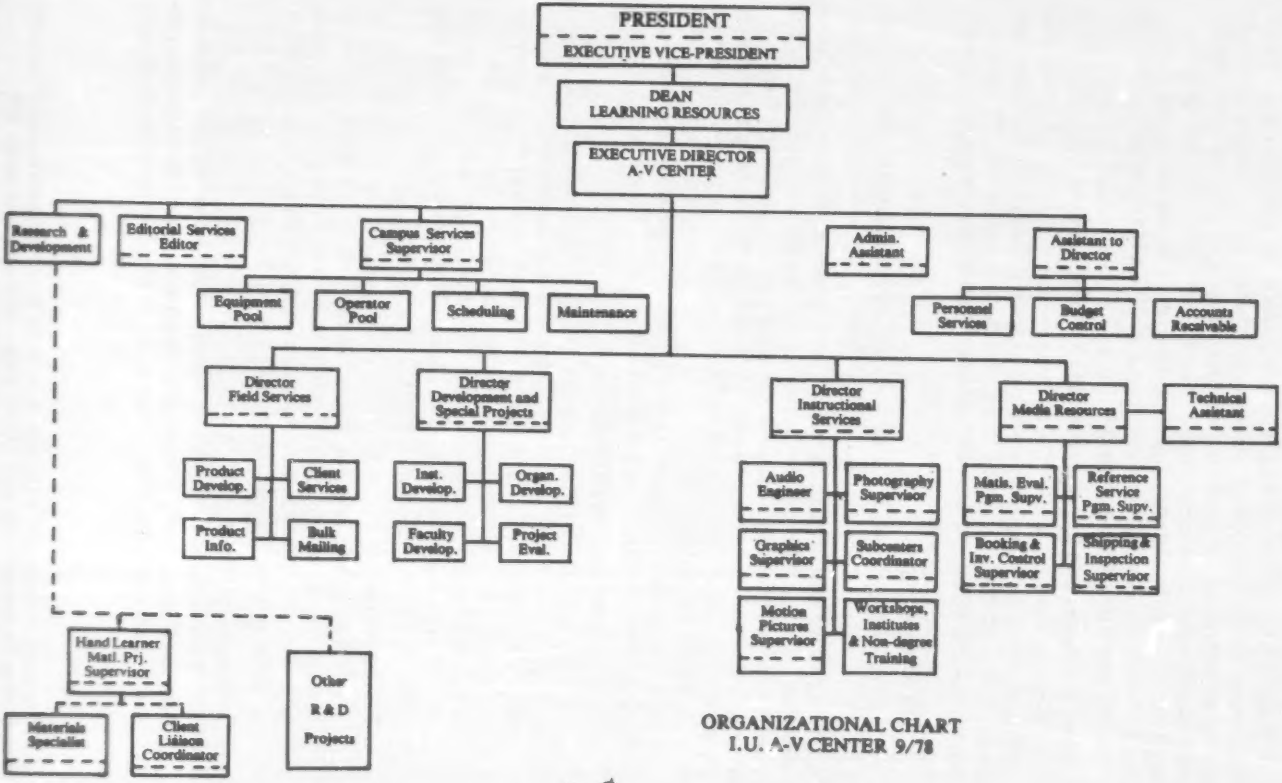
Field Services

The functions of this division include product development, information dissemination, and distribution activities on behalf of Indiana University produced materials, and materials produced by public television and other educational agencies.

Instructional Services

This division consists of six components. The Audio, Graphics, Motion Picture, and Photography departments provide design and production services covering a wide variety of media to serve instructional,

*The author wishes to give credit to Dr. E.L. Richardson, Executive Director of the Audio-Visual Center for the description of the I.U. AV Center as included in this paper. (18)



ORGANIZATIONAL CHART
I.U. A-V CENTER 9/78

publication, research, and service needs of the University. The six subcenters provide basic consultative and production services for instructional needs and serve as a liaison with the production departments and other divisions of the Center. The sixth component organizes and conducts a variety of workshops and institutes for University and other clients.

In addition to consulting and advising activities with faculty, staff, and students, in 1977-78 the central production units and the subcenters designed and produced 133,965 transparencies, slides, photo prints, motion picture films, illustrations, and recordings.

Over 860 people have attended the special workshops, and approximately 3,000 have attended the major institutes conducted during the past 10 years.

Media Resources

The Media Resources division is responsible for the film library including the national rental library covering a broad range of content areas at the university level. The film selection department has a professional staff to assist faculty with the evaluation of commercially produced educational films. This division also provides a media reference and referral service to faculty requesting bibliographic information and sources on all forms of media.

The faculty has access to approximately 9,500 film titles listed in our general catalog plus approximately 2,500 restricted and "reference use only" films.

In addition to the four divisions, a number of units and activities cut across the Audio-Visual Center administrative structure. These include:

Campus Services

This unit provides audio-visual equipment and operators for instructional use on the Bloomington campus.

Instructional Support for the Department of Instructional Systems Technology, I.U. School of Education

With few exceptions, the twenty-one faculty who teach an average of 250 full-time graduate students in Master's, Specialist, and Doctoral degree programs are employed half-time in graduate teaching of professional media courses in the Department of Instructional Systems Technology and half-time as administrators and/or specialists of various units of the Audio-Visual Center.

Functions within the I.U. School of Education.

This description of the operation of the I.U. Audio-Visual Center is rather over-powering and represents the largest university-based media center in the world with over 40 years of development.

Perhaps an example of a smaller technological resource center would be more appropriately discussed.

In addition to being chairman of the Department of Instructional Systems Technology within the I.U. School of Education, the author has the responsibility of being Coordinator of Media Services for the School.

OVERHEAD
TRANSPARENCY: Line and Staff Organizational Chart of School of Education Media Services (see page 125)

To provide learning resources for 140 faculty and a large body of undergraduate and graduate education students, we maintain five service centers:

A. The Education Library functions as a branch of the Main Library and selects, catalogs, and distributes books, monographs, and reference materials in the field of Education. It also makes available periodicals, dissertations, government documents, pamphlets, microfiche materials and faculty reserves.

B. The Curriculum Center selects, catalogs, and distributes state-adopted textbooks, curriculum guides, educational games and simulation materials. A special collection of teacher education materials useful in mainstreaming and training the handicapped is also housed here.

C. The Learning Center is designed for teaching audio-visual equipment operation, previewing audio-visual materials, and allowing students to produce inexpensive audio and/or visual classroom materials.

D. The Television Center assists students in preparing and viewing micro-teaching videotapes and provides television production and preview services for faculty and students.

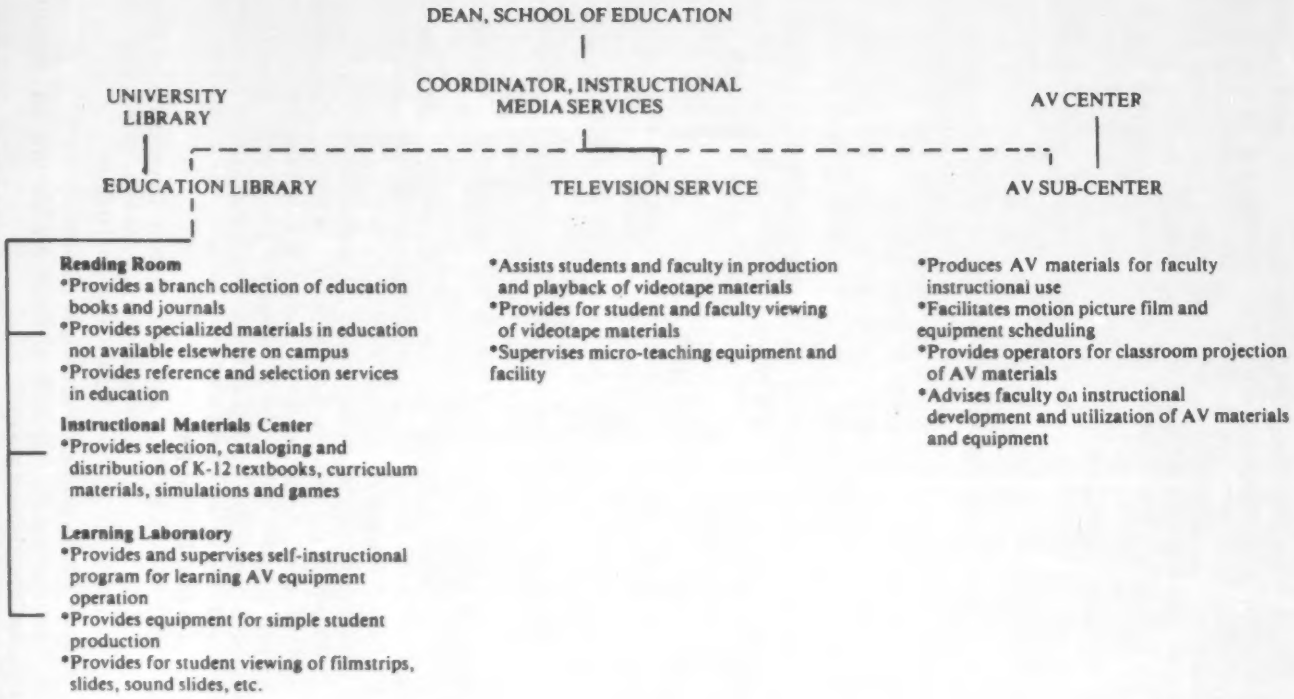
E. The Audio-Visual Subcenter coordinates the ordering and projection of films, provides audio-visual equipment set-ups, produces audio-visual instructional materials, and serves as a consultant to faculty on the development and utilization of media resources.

F. In addition, five PLATO terminals are also housed in the School of Education to enable students and faculty to produce and utilize computer-assisted instructional programs.

The technological services provided by the Audio-Visual Center to the Bloomington campus and six regional campuses service approximately 78,000 students; the special service centers housed in the I.U. School of Education are similarly duplicated in many outstanding universities.

Syracuse University, Michigan State University, and Florida State University are other outstanding examples of broad range programs providing excellent examples of Learning Resource Centers where:

1) each provides essential program design, resource selection, production, utilization and related technical services appropriate to its stated purposes;
2) each is oriented toward the improvement of teaching and learning within the institution;
3) responsibilities and functions of each center are clearly defined and available in writing;
4) policy coordination of the work of each center is achieved through appointment of a central advisory committee of faculty, students and administrators whose recommendations are made to the Dean of Learning Resources and Services or other responsible administrators. (2:3)


DEAN, SCHOOL OF EDUCATION
UNIVERSITY LIBRARY
COORDINATOR, INSTRUCTIONAL MEDIA SERVICES
AV CENTER
EDUCATION LIBRARY
TELEVISION SERVICE
AV SUB-CENTER
Reading Room
•Provides a branch collection of education books and journals
•Provides specialized materials in education not available elsewhere on campus
•Provides reference and selection services in education
Instructional Materials Center
•Provides selection, cataloging and distribution of K-12 textbooks, curriculum materials, simulations and games
Learning Laboratory
•Provides and supervises self-instructional program for learning AV equipment operation
•Provides equipment for simple student production
•Provides for student viewing of filmstrips, slides, sound slides, etc.
•Assists students and faculty in production and playback of videotape materials
•Provides for student and faculty viewing of videotape materials
•Supervises micro-teaching equipment and facility
•Produces AV materials for faculty instructional use
•Facilitates motion picture film and equipment scheduling
•Provides operators for classroom projection of AV materials
•Advises faculty on instructional development and utilization of AV materials and equipment

Perhaps the most optimum media services in terms of both professional staff for instructional development and comprehensive curriculum development within a "systems approach" are found in (1) science departments utilizing an audio-tutorial approach and (2) health science areas including notably schools of medicine, dentistry, and nursing.

Let's quickly take a visualized tour of two nationally recognized programs.

TWO × TWO SLIDE
PRESENTATION: Dr. Sam Postlethwait's pioneer audio-tutorial biology laboratory at Purdue University, West Lafayette, Indiana

Note the careful integration of three modes of communication — the traditional large-group general session devoted to announcements, film showings, guest lecturers and various course details; the integrated quiz sessions usually with 10 or less students and the instructor where students teach each other; and the most important element — supervised independent laboratory sessions — where the student learns by self-study at his own pace. (3:119)

Professors Janke and Foust write about a similar audio-tutorial laboratory at Wisconsin State University-Eau Claire designed to offer students an option to take the basic earth science series through the audio-tutorial mode of instruction. (15-19)

They report these interesting data:

1. Ninety percent of the students would choose this method of learning over the traditional lecture-laboratory system.
2. Students mastered the material slightly better under the audio-tutorial system than under the traditional method.
3. Audio-tutorial facilities were only 10 percent more expensive than a similar traditional laboratory set-up yet increased the capacity of the room by 50 percent and reduced the per credit cost of instruction by approximately 25 percent.

The success of the audio-tutorial approach seems underscored by its widespread acceptance on a variety of campuses and in many subject areas in the United States and abroad.

Examples include use in geography at Indiana University and the University of Wisconsin; in chemistry at Clemson University in North Carolina and Auburn University in Alabama; in geology at Ohio State and the University of Michigan; in psychology at the University of Cincinnati; in sociology at Columbia College, Missouri; and in western civilization at Southwestern Michigan College to name but a few!

TWO × TWO SLIDE
PRESENTATION: Indiana University Department of Nursing Instructional Communications and Educational Resources (NICER)

The NICER department functionally consists of four areas: the audio-visual support group, the instructional design/evaluation group, operations, and the media production group.

This department headed by Dr. Winston Long provides audio-visual support and curriculum design assistance to 150 full-time nursing faculty and 1700 nursing students. The most innovative aspect is the fact that the entire sophomore year nursing curriculum is mediated for self-paced instruction. Throughout the nursing curriculum, instructional media is an integral part of the learning environment.

Toward Academic Staff Training

How does one proceed to convince professors to move out from the traditional lecture-discussion mode to investigate and try out a "systems approach" to curriculum development? What approaches succeed in convincing instructors they can produce and use such new innovations as videotapes, sound-slide sets and self-instructional programmed modules?

What strategies are useful to begin to convince faculty that media have the potential of making their teaching more humanizing and individual rather than dehumanizing and a threat to their very existence?

These and numerous other equally challenging questions demand action! Colleges and universities are obligated to develop training programs to assist faculty in better understanding and utilizing these new technologies. Many are presently facing up to the need and pushing ahead with various diffusion approaches.

In discussing academic staff training in higher education in the United States, Dr. Jerry Gaff (9) distinguishes three approaches to the improvement of teaching:

1) Helping faculty members develop their talents and teaching skills (Faculty Development);
2) Redesigning courses and using new instructional materials (Instructional Development);
3) Reorganizing the institution itself to create a better environment for teaching (Organizational Development)

OVERHEAD
TRANSPARENCY: Alternative Conceptions of Instructional Improvement

Of the three approaches shown in the overhead — faculty development, instructional development and organizational development — let's put our focus on instructional development.

Many definitions might be suggested. However, the major focus of all such definitions seems to be "the systematic and continuous application of learning principles and educational technology to develop the most effective and efficient learning experiences for students." (9:47)

A few illustrations of the approaches being used by institutions throughout the United States to assist faculty in acquiring or refining instructional development capabilities might be useful.

1. Roderich Hart and Guston Frederick at Purdue University have developed a series of twelve self-study audio tapes and related study guides. Those dealing specifically with instructional development include: behavioral objectives; innovations in college instruction and instructional technology.

2. For a number of years, instructional development specialists at Michigan State University have offered a four-week workshop to enable MSU faculty to learn the skills necessary to design, produce, and evaluate self-instructional audio-visual materials. At the end of this workshop, participants (1) have completed a prototype AV module, ready to be tried out with students that will include objectives, a criterion test, a student workbook, forty or fifty 2" × 2" slides, and a 15 to 20 minute audiotape; and (2) are capable of trying out the prototype module and making necessary revisions. (7:71)

3. In 1974 the Faculty and Instructional Development Office at San Jose State University gathered data from faculty members indicating significant interest in developing their professional competencies. In response to this survey, Dr. Ron J. McBeath and Dr. Jerold Kemp have developed a series of thirteen self-instructional modules consisting of text and workbook sets, multi-media packages, tape cassettes, and a video-tape.

Frequently workshops are conducted where a coordinator of professional development serves as a group leader. The content and organization of these materials encourages faculty participation and interaction among faculty members from diverse backgrounds.

4. In the late 1960's Dr. Gene Faris, Dean of Learning Resources from Indiana University, obtained a grant to develop an institute to improve undergraduate instruction through the use of educational media within a systems approach to instruction. Major objectives of the program designed for 30 faculty participants were: (1) orientation to a systems approach to instruction; (2) orientation to possible roles of educational media in varying instructional situations; and (3) to subject a small body of information to systems analysis, including application and evaluation of instructional strategies conceptualized by participants.

Three hour meetings were held for 32 weeks with lectures and workshop activities provided by faculty from the Audio-Visual Center and nationally known experts such as Samuel Postlethwait, Wilbert McKeachie, Egon Guba, James Popham and others.

Faculty participants, working in small groups, applied the systems concept to specific curriculum development projects under the guidance of a project coordinator and faculty advisor.

In recent years, a series of special seminars have been sponsored by the Teaching Resources Center to assist Associate Instructors on the Bloomington campus of Indiana University in assuming their new teaching roles.

A very useful publication, *Getting Started: A Guide for Beginning College Instructors* (12), serves as the major resource in these seminar sessions.

5. Frank J. Vattano, Director of Instructional Development at Colorado State University, operates a similar instructional development lecture series with nationally recognized specialists invited about once a month to discuss topics of concern to the faculty.

6. Other institutions rely heavily on either outside or in-house consultants to work with individual faculty members on their special development projects.

In 1978, Dr. John A. Davis personally visited sixteen universities to study how well developed instructional improvement programs were organized and operating. Observation and interviews disclosed many examples of publications, self-instructional materials on teaching and testing, campus resources directories, and workshop outlines, indicating extensive and continuous training programs designed to acquaint faculty and teaching associates with new teaching skills and use of new technology. (6:10)

His report of the extensive activities and instructional development projects being engaged in by faculty members reinforced other researchers' conclusions that a veritable movement is underway in the U.S. toward the establishment of special organizations to implement new concepts of instructional improvement and faculty renewal.

Over a decade ago, Michigan State University established one of the first and most extensive educational development programs in the world of higher education. Let's study the 1976 organization chart of their Instructional Development and Telecommunication Services. (7:19)

OVERHEAD
TRANSPARENCY: Current organization of Instructional Development and Telecommunication Services

Michigan State's decade of success in assisting individual faculty and/or faculty teams in developing about 35 viable course development projects each year suggests that instructional development efforts which hold promise of lasting impact on students, faculty, and the institution itself must have several characteristics.

There must be institution support in the form of an educational development program with (a) a staff with expertise in all aspects of design and instructional development; (b) instructional technology resources for the selection, design, production, and distribution of both software and hardware; and (c) staff expertise in instructional evaluation and revision.

Instructional Technology — Boon or Bane?

How important will the role of instructional technology prove to be in the improvement of higher education?

Will it be just another expensive educational diversion or will educators be wise enough to harness its potential to produce effective yet interesting instructional materials for college and adult learners?

Is a "systems approach" in education an educational theorist's dream or can it be an effective paradigm for guiding us in systematic instructional development efforts?

Positive responses to these challenges will depend upon the quality of leadership we provide. A start has been made. New media, better learning theories and promising "systems models" have emerged. But the gap between current practice and future potential is great.

Only time will reveal whether or not educators can capitalize on and refine current efforts to improve teaching and learning. The alternative is to return to the way it was before emergence of the notion that faculty, instruction, and organizations can and should be systematically developed.

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14

SUPPORTIVE INFRASTRUCTURE, PROFESSIONAL TRAINING AND THE USE OF EDUCATIONAL TECHNOLOGY FOR DEVELOPING EFFECTIVE TEACHING-LEARNING PROCESSES IN MALAYSIAN UNIVERSITIES

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Preamble:

The purpose of this paper is to present a general picture to the Conference participants of the current situation in Malaysian Universities with regards to the infrastructure and the use of Educational technology for improving teaching and learning.

The paper is not intended to be exhaustive in detail nor do we have sufficient time to gather every single detail. As such we had pre-determined what we felt were the more significant aspects to be looked at as far as efforts towards improving teaching and learning are concerned. We had thus come up with the following main and sub-headings:—

1. Supportive Infrastructure
   - 1.1 Moral support
   - 1.2 Organizational support
   - 1.3 Financial support
   - 1.4 Facilities and services support.
2. Professional Training
   - 2.1 Orientation program for new staf
   - 2.2 Teaching-learning workshops/seminars on campus
   - 2.3 Attending teaching-learning conferences/short courses elsewhere
   - 2.4 Formal training
3. Use of Educational Technology
   - 3.1 Systematic curriculum development
   - 3.2 Use of AV resources.

Apart from our own Institution, Universiti Sains Malaysia, we spent an average of one-day at each of the other five Institutions, namely Universiti Kebangsaan Malaysia (UKM), Universiti Malaya (UM), Universiti Pertanian Malaysia (UPM), Universiti Teknologi Malaysia (UTM) and Institut Teknologi Mara (ITM), to gather the necessary information. This was conducted through interviews/discussions with the relevant people, viewing of the physical facilities and examination of the literature collected from these institutions. Obviously this task would have been impossible without the full cooperation of the Institutions concerned and their staff who

had been most cooperative and generous in their assistance. Therefore we feel it is most appropriate for us to record a sincere vote of thanks here to the Institutions and their staff, some of whom are present at this Conference.

We are certain that there will be gaps of information and some inadvertant inaccuracies but we hope our Malaysian colleagues present will not hesitate to help us by volunteering further information with regards to their own Institutions if need be. For ease of reference we had summarised the information gathered Institution by Institution in the form of a table which is attached as an appendix to this paper.

Finally we have included Institut Teknologi MARA in our survey not only because the Institute also conducts external university degree courses but also we are aware that conscious efforts are being made there to assist staff in making their teaching more effective.

Introduction

In order to enable Conference participants to view the main contents of this paper in the proper context we feel that it is necessary to provide some background information on university education in Malaysia first.

Compared to the more developed countries, university education in Malaysia is of very recent vintage. The oldest university in the country, Universiti Malaya was established only in 1961 and until 1969 it was the sole university in the country serving a population of 10 million. However over the next three years between 1969 and 1971, a rapid phase of development took place when four other universities were established. Universiti Sains Malaysia and Universiti Kebangsaan Malaysia were new establishments whereas Universiti Pertanian Malaysia and Universiti Teknologi Malaysia were former diploma awarding colleges. Not only the number of universities had increased, but the enrolment in each institution increased rapidly once it was established. This rapid expansion of university education was in response to (1) the increase in demand for university places as a result of the expansion of education at school level and (2) the increasing demands for well qualified personnel, particularly in the fields of science and technology as a result of the Government's efforts in rapid national development.

The sudden expansion in university education has brought on a number of features in these institutions which are related to teaching and learning methods.

1. Recruitment of academic staff with the appropriate qualifications and experience becomes difficult. Each university has to formulate its own scheme of recruitment and training.
2. A high proportion of the academic staff is very young. For example in USM, 56% of the academic staff are within the age range of 25-34 years. The majority were recruited immediately after they had obtained their higher degrees and therefore 70% had either no teaching or less than three years of teaching experience.
3. University education is no longer confined to the "elitist" few or the "high flyers", or the well-to-do. The student population has become much more heterogeneous in terms of academic, language, cultural, regional and socio-economic backgrounds.
4. University education has put a much greater financial strain on the Government and whatever funds available have to be spread out over a greater number of institutions.

One other relevant and significant feature which ought to be mentioned here is that our Country is in the midst of implementing the national policy of switching the medium of instruction from English to Bahasa Malaysia, the Malaysian National Language and by 1983 Bahasa Malaysia will be the principal language of instruction with English as a second language at university level.

Finally we would like to mention the current modes of teaching-learning and assessment in Malaysian universities. To give an accurate and detailed description would be impossible since the complexity of the teaching-learning pattern is such that even within one institution it can only be described in general terms, let alone across six institutions. Nevertheless, by and large teaching-learning and assessment methods are conventional. The number of lecture theatres, large and small in each institution must indicate that lecturing is the main mode of instruction. The use of tutorials in support of the lectures is the rule. However, in practice the "tutorial" takes many forms depending on the needs perceived by the tutor. It can be another lecture, a discussion, a question and answer session, a seminar, a demonstration of some skills or techniques, problem solving or different combination of these. Of course with the practical based courses, practical sessions and field study are also incorporated. Project work is sometimes part of the undergraduate's programme. Apart from courses which are highly practical in nature, the end of term formal paper-sitting examination carries the most weight in assessment. In USM, 70% examination and 30% coursework assessment is the norm for most courses.

Supportive Infrastructure

It is well and good to realise the need for improving teaching-learning in our universities but the important question is — "Is the necessary supportive infrastructure for such improvement to occur being provided, realising how taxing and complex this task is?" Reasons for resisting change in teaching and learning methods are not difficult to come by and therefore unless conditions are conducive and attractive to initiate change, few academic staff would venture forth to look critically at their teaching and students' learning. Hence we feel that every effort ought to be made by the institution to provide the right supportive and rewarding climate to their staff if they genuinely wish to encourage more effective teaching and learning.

Then the next question is — "What types of supportive infrastructure would be deemed conducive and encouraging for the advancement of the teaching-learning process in our universities?" For this paper we have identified four major forms of support.

1. **Moral support**

   Strong moral support coming from all sectors of the university — the Vice-Chancellor down to the Deans and the teaching staff themselves is a vital pre-requisite to teaching-learning improvement. If the top administration does not regard the teaching function as important, no amount of enthusiasm and dedication of the academic staff would be able to sustain their initial efforts to improve their teaching. If they have to survive in their institution they will have to conform and "play the game" accordingly sooner or later.

On the other hand, if the administration is very supportive and encouraging towards good teaching, but the academic staff's attitude is such that they are indifferent and unwilling to innovate in their teaching, progress will be slow and painful. Hence moral support by the administration must be matched by interest and enthusiasm at the grass-root level.

Support by the administration can be demonstrated in a very effective way which have been well proven in the case of encouraging good research and publication. Why should good efforts in improving teaching and learning be not rewarded to the same extent as in the case of research and publication? We feel certain that if this is seen to be done it will be the strongest incentive for the academic staff to be innovative in their methods.

Perhaps another form of moral support towards more effective teaching and learning is to dispel the fear that non-lecture methods of teaching do not measure up to the traditional lecturing method. Our main concern should be to facilitate students' learning and not how well we have performed in our lectures. Research have shown that the lecture is not necessarily the best method from which students learn.

While the administration in five of the six institutions indicate their support for teaching-learning improvement, the degree, concept and practice vary. USM, ITM, UTM and UM, perhaps in that order, have shown very strong support not only in thought but in practice as well. These three institutions have organised various activities with the aim of helping their staff in acquiring the necessary knowledge, skills and experience for effective teaching. USM and ITM, have already devised definite plans whereas UTM and UM's activities are ad hoc. However, UM's Vice-Chancellor had written a paper in favour of improving teaching and action is being taken to implement it. The translation of moral support into the other three more concrete forms of support will be described under their separate headings.

However, it is significant to note that at this junction, no institution has clear-cut plan for rewarding efforts shown by academic staff in improving teaching and learning.

2. **Organizational support**

Moral support obviously needs to be translated into action and this is where organizational support is required To ensure that teaching-learning improvement activities are not ad hoc but systematically planned and implemented the formation of a high-powered committee is necessary. The high-powered nature of this committee reflects the importance the institution attaches to matters pertaining to teaching and learning. It will also ensure that adequate resources, including funds, would be placed at its disposal. This committee should be regarded as the nerve-centre of the whole process of teaching-learning improvement.

In our survey of the six institutions, only USM has a definite committee i.e. the Teaching-Learning Process Committee of Senate established in April 1977, with the Vice-Chancellor and Deputy Vice-

Chancellor (Academic Affairs) as Chairman and Deputy Chairman respectively. Every School as well as the Academic staff Association has a representative in this Committee. The Coordinators of the ETU and Off-Campus Programme and another member of ETU are also members of this Committee. Its terms of reference are comprehensive and covers all matters pertaining to teaching and learning in the University. It was subsequent to the establishment of this Committee that the ad hoc efforts had given way to more permanent planning and implementation of teaching-learning improvement activities. So far, the ETU, established in 1974 has been the "Operational Centre" for these activities but an even more permanent step has already been taken with the University Council's approval of the setting up of a Teaching-Learning Advisory Unit in 1980. This Unit will have a core of full-time staff working closely with the ETU and others in their respective Schools to take charge of the planning and implementation of all teaching-learning improvement activities.

Although UM and ITM have no definite committees, they work through the Dean's Committe and the Training and Scholarship Committee respectively. ITM and UTM also establish an ad hoc Committee each time an activity is to be organised.

3. **Financial support**

Moral and organizational supports must be backed up with financial support which in fact, is the ultimate determinant of success or failure. Enthusiasm cannot be sustained and well-planned activities cannot be implemented without the necessary funds. Everything involved in increasing teaching-learning effectiveness costs money — media resources, personnel, workshops, courses, travels — but in the long run it is money well spent when we consider the fact that teaching becomes more efficient and learning becomes more motivating and effective. Besides, staff would often measure administration support by the funds it allocates and this is one of the most concrete ways of demonstrating support.

In general financial support is given to the building-up of media resources mainly in the central libraries in all the six Malaysian institutions but the amount varies across institutions. More positive support may be indicated in UKM, USM and ITM where facilities for viewing and listening to non-book materials are readily available in their libraries. The two institutions, UM and UKM each with a Medical Faculty provide substantial funds to ensure good media support to the medical courses. In the case of USM very heavy financial support is given, initially in setting up the ETU in 1974 and subsequently in further developing and running its range of twelve central services aiming at teaching-learning improvement. Commencing last year large allocations were given to equipping all lecture theatres with a range of AV equipment. Likewise ITM has set up its Educational Resource and Development Unit in 1978.

Besides such financial support, what we particularly wish to look for is the direct allocation of funds for implementing teaching-learning improvement activities. Currently the most tangible form is

found in USM, where $10,000/- were allocated for the last four months of 1977 and $25,000/- each for 1978 and 1979. These sums do not include remuneration for staff but are essentially for purchase of reference resources and for workshop and course expenditure. The estimates for 1980 is even much higher in view of the setting up of the Teaching-Learning Unit. ITM, followed by UTM do spend substantial sums on workshops and courses but in the case of the latter, these activities are not so regular.

4. **Facilities and services support**

Much of the financial support must also be channelled to provide the facilities and services needed by a wider range of teaching-learning strategies. In the first instance this form of support would be needed for conducting workshops and courses for the academic staff and subsequently, having acquired new knowledge, techniques and skills they need to put them into practice. Providing good facilities and efficiently operated media services to the staff goes a long way in encouraging them to innovate in their teaching strategies.

Time is a very scarce commodity in the life of an academic where so many other functions compete against teaching for it. In terms of efficiency and economy a central unit, equipped with sufficient quantity and variety of audio-visual resources and personnel to operate a range of services catering to the needs of the institution is more suitable than Faculty or Departmental based resources. To augment what are available at the central unit, the major teaching areas should be installed with the commonly required audio-visual equipment.

As expected, we found in our brief survey of the six institutions, the range, quantity, organization and management of media facilities and services vary. UKM and USM have an established central unit each while ITM is just setting up one.The UKM's Educational Technology Centre concentrates in providing graphics, photographics and printing services. A limited AV equipment loan service is also operated. The USM's ETU housed in a purpose-built building, is wider based, with 6 academic and 26 office and technical staff, to operate a range of 12 services, right from advisory and consultancy in the use of educational technology to equipment loan. (Please refer to the ETU brochure). Besides the services, the academic staff in the ETU teach Educational Technology courses to undergraduate, post-graduate and in-service students. They also organize and conduct workshops and courses for the other academic staff as part of the University's teaching-learning improvement programme.

The next is Faculty-based units. UKM and UM have well equipped medical illustration units attached to their Medical Faculties. The Education Faculties in UM and UPM also have their own AV unit.

In all six institutions there are at least some teaching areas in which projected materials can be shown. The usual range of AV equipment including video recording and playback are available for staff's use. However in the institutions which do not have central

units as yet, such equipment are scattered among Faculties and Departments, Libraries and even Registry in one institution.

In some institutions, notably UPM, UTM and ITM facilities and services based in Departments and Faculties for their own teaching-learning requirements are also made available to other Department or Faculty's use.

Professional Training

We confine professional training to any form of organized activity which aims directly at helping the academic staff acquire knowledge and experience in university teaching and learning. It includes activities within or outside the institution or even overseas. Assuming the supportive infrastructure is there, the next logical thing to consider would be the training programme for academic staff.

It appears that Malaysian universities at this juncture, concentrate much more on providing training opportunities to their academic staff to acquire higher academic qualifications to fill the needs of rapid university education expansion. Professional training will have to take second place even though most of the top administration in these institutions realise that some form of professional training is also important.

1. **Orientation programme for new staff**

   Depending on the content and how it is conducted, such a programme can be very useful to new academic staff. Apart from saving him time by not having to "self-discover" how the institutional machinery works, whom to see for what purpose etc., it is also indicative of how much care the administration takes of its new recruits. Time saved can be utilised for better preparation of his teaching.

   No institution has provided a regular orientation programme for new academic staff as they all do for new students every year. USM had organized this activity twice, in 1975 and 1977. While the first programme confined itself to familiarization with the University's administrative set-up and functions, the second included discussions on the Malaysian education system, the use of media in teaching and learning and visits to the Library and the Educational Technology Unit. In the light of feedbacks obtained from the participants this programme would be further modified to include more aspects of university teaching and learning in the future when there is a sufficient number of new staff to warrant it. New academic staff at UTM have informal meetings with the Vice-Chancellor and this practice is probably fairly common in all the other universities. New academic staff usually learn more about their institutions and their practices from colleagues, but this takes time.

2. **Teaching-learning workshops/seminars on campus**

   This form of activity is common in institutions which are keen to help its staff to improve their teaching. Lecturing, small group teaching, methods of assessment, production of self-learning materials, laboratory teaching and the use of media resources are the common topics covered in such workshops. Again, depending on the content,

method, the people conducting and the enthusiasm of the participants, these sessions can be very fruitful to the staff.

Five of the six institutions have organized such activities, though in most cases they are not on a regular basis. The number, duration of each activity, the content and method vary among the five institutions. Some were School/Faculty-based and many were conducted with the assistance of overseas visitors. The duration of these workshops varied from half to four days. Participation was voluntary in most instances. Responses from staff vary according to Faculty/School. The USM's experience has been encouraging.

ITM, with the setting up of its Educational Resource and Development Unit in 1978, expects to organize such activities on a more systematic and regular basis.

USM's activities have become more systematically planned and conducted, since the Teaching-Learning Process Committee of Senate was established in 1977. Apart from the ETU which at present coordinates and conduct these activities with the help of overseas personnel, a new University Teaching-Learning Advisory Unit will be formed in 1980 to take over the responsibility but still working very closely with the ETU. In 1978 a total of 11 workshops were held ranging from a four-day residential workshop for less experienced staff to a half-day seminar on how to help students learn more effectively. This year the activities concentrate more on training a core of more senior staff who can then help their own colleagues in matters pertaining to teaching and learning improvement.

UTM so far has conducted several such activities, the last one in 1977 was made compulsory for all academic staff.

3. **Attending teaching-learning conferences/short courses elsewhere**

Attending conferences or short courses held elsewhere is another form of professional training activity, but such activities are still rare in the Asean region. Apart from those held overseas, this Conference is the first one of this nature to be held in this country. Therefore it is not surprising that none of the institutions except USM have sent their academic staff on such conferences previously. Since 1975, USM has sent four persons to these conferences, three of which presented papers.

4. **Formal training**

This would be courses formally conducted of duration no less than a fortnight. This concept of formal professional training for university academic staff in this country is still new. So far very few have undergone such training. ITM has conducted short formal training courses with the help of overseas personnel. USM has actually sent one member overseas for a one-year M.A. course on university teaching and learning in 1974-75. This year twenty members are undergoing a part-time on-campus programme partly by self-study materials prepared by two overseas personnel and administered by the ETU. In addition, one is already overseas and two more will follow soon for full-time courses. Hopefully, this group together with

the academic staff of the ETU will form the nucleus of resource personnel to spearhead future development in teaching-learning improvement.

Use of Educational Technology

We use the term Educational Technology here to cover not just the use of all kinds of educational resources to facilitate teaching and learning, but also the use of some form of systems approach in the planning and administering of an educational programme — be it a unit of instruction or the entire curriculum. Therefore in our survey we were particularly interested in finding out whether educational technology principles are being applied to curriculum development and to what extent AV resources are being used. The term curriculum development is being used in the all encompassing and cyclic sense, from planning to overall evaluation and inclusive of media integration.

1. **Systematic curriculum development**

This is one area where we are not so certain, except in our own institution, simply because we did not have sufficient time to talk to a sufficient number of people in each institution. What we gather generally is that there is no set pattern of procedure for curriculum development in any of the institutions. In most cases, each department decides on the kinds of courses it feels would fulfil the needs of their programms and often what courses can be offered is dependent upon what academic staff are available in the department at that time. By and large the curriculum development model is a very straight forward one — decisions on content, textbooks and other references and assessment procedure. These decisions, in most instances are made by the academic staff who will teach the course. Clear aims and objectives are not always included in course outlines.

Systematic curriculum evaluation is not a common practice, but the use of external examiners to some extent fulfils part of this function. Analysis of examination results is another common form of course evaluation in current practice.

Thus in general it appears that the application of educational technology to curriculum development in Malaysian universities is not widespread at all and it is not surprising. How many of the academic staff do have formal training and experience in curriculum development? Unless an institution decides that proper curriculum development procedure is important and provides the appropriate training to its staff, the existing practice will continue to perpetuate.

2. **Use of AV resources**

Although the use of AV resources should not be taken as synonymous with educational technology per se nevertheless it often indicates that some thought has been given to teaching-learning methods or teaching strategies when someone decides to incorporate their use in their teaching. It is for this reason that we decided to look into this, but we discovered that it was not easy to determine precisely the extent of usage.

Compared to institutions in the western countries, the AV resource usage in our institutions is still considered low. Not only the usage varies from one institution to the other, but within the same institution the usage among different faculties, departments and even courses also varies. The nature of courses has a lot to do with this. Medical courses use AV resources extensively, followed by communication and education courses. Of course the amount of usage is also dependent on the facilities and services available (as was discussed earlier on in this paper), as well as the knowledge and competency of the staff in using AV resources. For example, since the setting up of the ETU and the holding of numerous AV workshops for the academic staff in USM, the usage in this institution is progressively increasing.

Conclusion

1. **Supportive infrastructure**

In most of the institutions the administration sees the need for helping their academic staff to acquire more knowledge and skills in teaching and the staff's response have been fairly favourable. Some activities towards this end have been initiated but are mostly on an ad hoc basis. Existing facilities and services that lend support to teaching and learning improvement vary among institutions but the basic needs can be catered for.

We feel that if the institution's intention is to encourage teaching-learning innovation on a regular basis then organizational support must first be established. Without this support activities will remain ad hoc and chances of sustaining enthusiasm and interest will be slim. A high-powered committee is most essential, where policy decisions are made and necessary financial support can be obtained. Apart from providing funds for media resources adequate allocations for organizing workshops, seminars and courses are also required. These expenditures ought to be budgetted annually.

Besides the committee — a central teaching-learning support unit is very essential for planning, coordinating and conducting the activities. This unit is the place where academic staff can come to seek help and advice on teaching-learning matter.

2. **Professional training**

Formal training in teaching-learning methods and educational technology for academic staff is rarely provided for. Ad hoc workshops, seminars and short courses are more common. Orientation programme for new staff is also not a regular feature. This situation is likely to be related to the lack of organizational support. In the final analysis, professional training is necessary to ensure continuity in teaching-learning improvement. Initially at least a core of people should be suitably trained to staff the central unit so that they are able to organize and conduct activities for the others. They can also act as resource persons to offer help and advice to their colleagues in the institution. Hopefully through this procedure the number of personnel who can offer assistance and advice to their colleagues will snow-

ball and so will the innovations in teaching-learning methods.

Formal training should be complemented by shorter workshops and seminars on different aspects of university teaching and learning on a regular basis. These sessions offer the opportunities to colleagues to exchange ideas and share knowledge and experiences. Such activities can be university or School/Faculty based. Often problems of teaching and learning are subject or discipline based.

Attending conferences, workshops and courses at other institutions can also enrich one's knowledge and experience.

There is a need for Malaysian institutions to push professional training much harder if they are genuinely committed to teaching-learning improvement.

3. **Use of Educational Technology**

We were not able to offer very precise information in this area partly due to the complex nature of curriculum development and the varying amount of AV resource usage depending on the nature of the courses. We hope that if professional training activities are stepped up this will in turn increase the application of educational technology in curriculum development at university level.

APPENDIX

I. SUPPORTIVE INFRASTRUCTURE	ITM	UKM	UM	UPM	USM	UTM
1. Moral Support	Good support from the top.	Not directly; assumes staff capable of teaching on appointment.	In favour of improving teaching quality; a paper has been written on this by the VC and action is being taken.	Administration sees the need for professional training; no programme implemented so far.	Good support from VC, DVCs and some Deans. Interst shown by academic staff very encouraging.	Administration sees the need for professional training; encouragement given to organize such activities.
1.2 Organizational Support	Training and scholarship Comm. School based ad hoc Comm. for each T-L activity.	None.	No separate Comm. but comes under Deans' Comm. with VC as Chairman. T-L matters discussed here.	None.	T-L Process Comm. of Senate established in 1977 with VC as Chairman and DVC (Academic) as Vice-Chairman. 2. T-L Process Working Sub-Comm. with DVC (Academic) as Chairman. 3. Ed. Tech. Advisory Comm. established in 1974 with VC as Chairman but ceased functioning in 1976.	No standing Comm., but ad hoc for organizing courses.
1.3 Financial Support	Substantial both for T-L activities and media resources.	Substantial for building up media resources.	Support for media resources particularly in Medical and Education Faculties.	Support for media resources.	M$25,000/- per year, since 1978 for T-L activities. Very substantial support for media resources in ETU, Library and Lecture Theatres.	Support for T-L activities but not regular. Substantial for media software resources.

1. SUPPORTIVE INFRASTRUCTURE	ITM	UKM	UM	UPM	USM	UTM
1.4 Facilities & Services Support	1. Educational Resources and Development Unit established in 1978. Functions — media resource services; running of in-service training courses in TL effectiveness; consultancy. 2. School of Mass Communication. Simple video recording and playback unit. 3. Language Centre provides loan of audio equipment and tapes. 4. Library — substantial non-book section; provides projection services and facilities — well utilized; video recording and playback machine.	1. Ed. Tech. Centre provides good graphics, photographics and printing facilities, a limited equipment loan service. 2. Library 90 wet carrels for viewing projected materials but only few fully-equipped; 3 viewing theatres with projection service; substantial non-book collection. 3. Medical Ed. Tech. Service — serves Medical Faculty only; made up of 4 units — Audio visual/CCTV, Technical Workshop, Medical Museum/graphic, medical photography; provides comprehensive services to the needs of medical teaching & learning. 4. A few Depts. have own personnel and facilities for photography.	No Central Unit but Faculty based notably Medical and Education. 1. Medical Illustration Unit provides comprehensive services and well utilized. 2. Education — Good AV facilities including TV Studio mainly geared to teacher education.	No Central unit; some faculty based. 1. Education — newly established Resource Center with some AV equipment geared to teacher education. 2. Centre for Extension and Continuing Education — photographic,, graphic and printing facilities/services used by other Facilities. 3. Limited projection equipment under Registry's charge.	1. Comprehensive range centralised at ETU and some at main Library. For ETU refer to Brochure. 2. Library Viewing Theatre — 1 Listening Room — 1 Wet carrels — 35 Recording Room — 1 3. Language labs. at Language Unit. 4. Major lecture theatres equipped with permanent AV equipment.	No Central Unit 1. AV Coordinated by Library. 2. Photography in Physics Dept. 3. TV Studio in electrical engineering faculty. Not used by others due to lack of staff. 4. Language labs — 2

2. PROFESSIONAL TRAINING	ITM	UKM	UM	UPM	USM	UTM
2.1 Orientation programme for new staff.	Not sure	None	None	None.	Not regular, so far twice, 1975, 77.	Informal meeting between VC and new staff.
2.2 T-L Workshops/ Seminars on campus.	School-based seminars. A Unit formed in 1978 to organize and conduct these.	None	Several but not regular; mainly conducted by overseas visitors. Tutors directed ato attend; lecturers voluntary.	Faculty-based workshops but not regular.	Since 1975 but ad hoc till 1977. More regular and better planned from 1977. Unit will be formed in 1980 to plan, organize and conduct these. Duration between ½-4 days; on or away from campus.	1974-76. Short course for new staff but later open to all. 1977 — 3 day course, compulsory for all. On or away from campus. Ed. faculty annual T-L workshop.
2.3 Attending T-L Conference/ Short courses elsewhere	None	None	Staff already on study leave overseas sometimes asked to attend short T-L courses as well.	2 had attended.	Since 1975, 4 had attended.	None.
2.4 Formal	1. Dip. Ed. for some staff. Language teaching at RELC. 2. T-L courses conducted by overseas personnel.	None.	None.	Administration sees the need, but no plan for this so far.	1974 — one for MA overseas; 1979 — 20 for part-time on-campus; 3 for full-time overseas.	None.

3. USE OF EDUCATIONAL TECHNOLOGY	ITM	UKM	UM	UPM	USM	UTM
3.1 Curriculum Development	No set pattern. School does it in their own way. Use of external examiners.	No set pattern. Faculty Dept. does it in their own way. Use of external examiners.	No set pattern. Faculty/Dept. does it in their own way. Curriculum looked into when students complain. Use of external examiners.	No set pattern. Faculty/Dept. does it in their own way. Advisory Board with outside members conducts assessment of curriculum. Use of external examiners.	No set pattern. School go about it in their own way. Some schools evaluate courses with student feedback forms. Use of external examiners.	No set pattern. Faculty/Dept. does it in their own way. Engineering faculty has student evaluation by questionaire. Use of external examiners.
3.2 Use of AV Resources	Usage quite widespread; some schools use more depending on nature of courses.	Extensively used in Medical Faculty; fairly well equipped. For other faculties popular use of graphics and photographics well provided for by the Ed. Tech. Centre.	More extensively used by Medical, Education and Economics Faculties including use of CCTV.	The need to use AV only for large classes. Move extensively used by Education and Extension and Continuing Education staff.	Use has progressively increased since the setting-up of ETU and the running of AV Workshops for staff; still varies depending on nature of courses. e.g. Education and Communication courses use AV extensively.	Use of slides is popular.

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THE DEVELOPMENT OF TERTIARY TEACHING SERVICES IN THE UNIVERSITY OF HONGKONG

by
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Abstract:

The historical link between the University of Hongkong and British and Commonwealth Universities is outlined. And features of the University's growth into the early part of the next decade are described. Both circumstances are seen as key elements in a thrust for the provision of teacher education services within the institution, and the origin and form of two service units created for such a purpose are presented in some detail. Taken together, these units — the Centre for Media Resources and the Committee on Orientation for Senior Staff — represent the present level of organized commitment to the enhancement of teaching performance within the University of Hongkong.*

The paper concludes with a speculation upon future trends in university teaching, not only for Hongkong, but for the Region as a whole.

Introduction

The University of Hongkong was founded in 1911 on the then Hongkong College of Medicine. It opened its doors in October 1912 to fifty three students with initial priority commitments to the disciplines of Engineering and Medicine. Today, the student population stands close to 5000 and that of the teaching staff is nearly 600. Five Faculties (Arts, Engineering, Medicine, Science, Social Science) and three Schools (Arts, Education, Law) serve the primary educational needs of the student population (see Appendix I for more statistical detail).

By the end of the current triennium (1981) student numbers will have increased to 5,500 and are eventually expected to plateau at around 7,000 in the 1990's. Thus the 1970's will have been for the University of Hongkong what the 1960's were for many of the British universities: that is to say, a period of very substantial growth.

Background

Partly as an effect of her historical roots as a colonial institution, but chiefly nowadays in the interests of international parity of esteem, the University of Hongkong is in close harmony with patterns of university education in

*Supplementary literature concerning the work of the Center for Media Resources and video-taped abstracts of some of the teaching exercises undertaken in the Center will be made available to delegates as an accompaniment to this paper.

Britain — both in the form and content of curricula and in the pattern and standards of examination.

In order to appreciate its present concern for improvements in its teaching service it is first necessary to consider briefly the principal events which have helped induce and shape a similar earlier concern among sister institutions in Britain. These have been.....

1. The publication in 1964 of the 'Hale Report' on *University Teaching Methods* with its endorsement of the development of *voluntary staff training programmes* designed to encourage the specification of teaching objectives, enhance the operational skills of the teacher, and optimize student motivation to learn.
2. The publication in 1965 of the 'Brynmor Jones Report' on *The Use of Audio-Visual Aids in Higher Scientific Education* and the subsequent formation of a national structure of educational technology as an enabling measure which has subsequently and significantly affected the educational process throughout the tertiary sector.
3. The formation in 1972 of a *Coordinating Committee for the Training of University Teachers* representing the interests of the four most important national bodies concerned with university education: the Committee of Vice-Chancellors and Principals (CVCP), the University Grants Committee (UGC), the Association of University Teachers (AUT) and the National Union of Students (NUS). This Committee provides valuable comment on the evolution of university teacher education in Britain.

It is by building on such foundations as the above that the University of London Institute of Education is now able to offer a full-time diploma course in university teaching techniques under the auspices of its University Teaching Methods Unit (UTMU). In fact, all British universities now offer some kind of *staff development programme*: though the nature and duration of what is offered varies enormously from place-to-place.

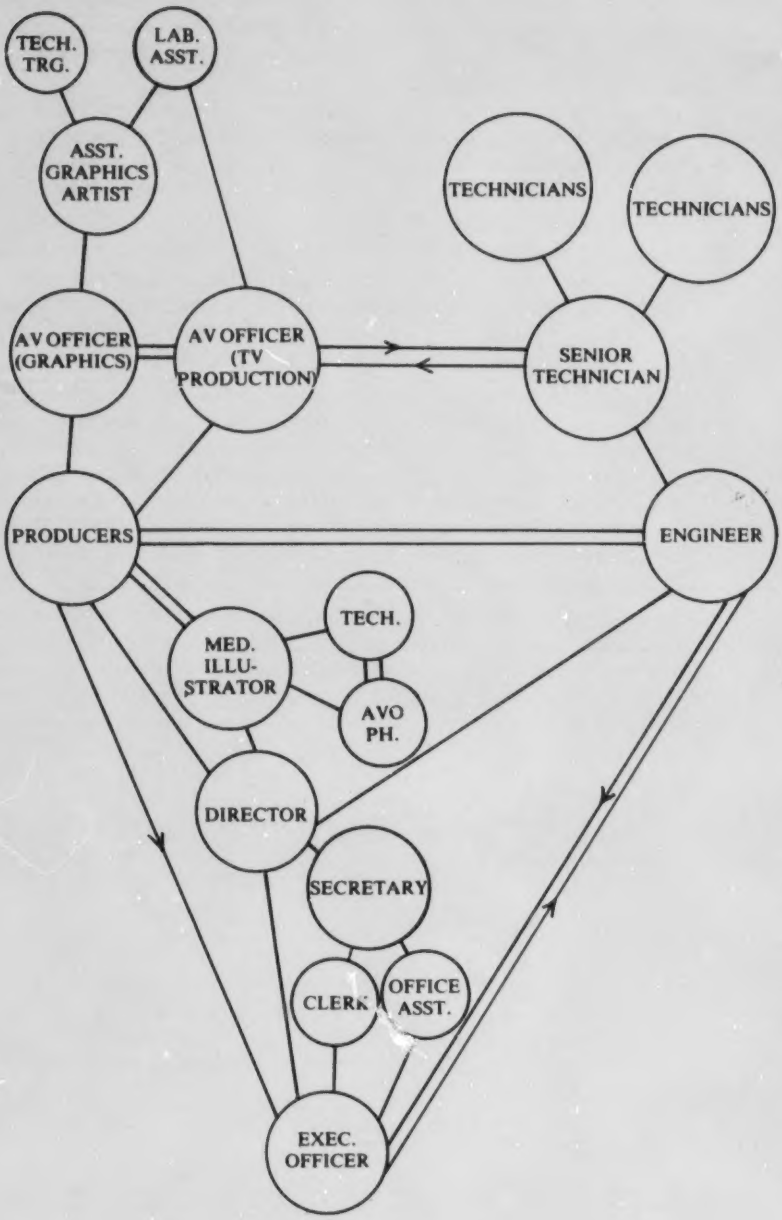
Not only did the pressures of physical expansion during the sixties exacerbate the need to make university teaching more efficient and more effective but the advent of the Open University, which began in 1971 with 20,000 students following its foundation courses, demonstrated beyond question the potency of educational technology systems as vehicles for the delivery of high quality instruction.

Against this background, and in response to similar if more dilute pressures, the University of Hongkong has so far taken two steps to strengthen itself pedagogically. The first and most important step was taken in 1975 when an Audio-Visual Center was established to develop and coordinate rational support services throughout the university. And the second was taken in 1977 when a Senate Committee on the Orientation of (Newly Appointed) Senior Staff was brought into being.....

Infrastructure & Educational Technology

To mark the inauguration of its full range of support services the Audio-Visual Center was renamed *The Center For Media Resources* (CMR) in 1978.

CMR ORGANIZATION



It presently incorporates a small educational technology library and administrative facility, a workshop, a studio and a graphics unit. Detailed patterns of service delivery for 1977/78 are given in histogram form in Appendix II. The range of services which it has to offer are communicated by various means to teaching staff. Vehicles include: *The Staff Manual*, *The University Monthly Bulletin*, and the university newspaper *Interflow*. A summary of these services follows the diagram below of the CMR's internal organization.....

(a) *Servicing & Maintenance:* The Center offers to all Departments and Schools the facility of repair, servicing, and maintenance of audio-visual equipment free of charge but there is a charge for materials consumed. The Center also has a faults reporting system in respect of equipment in centrally time-tabled teaching rooms to keep the equipment trouble-free and ready for use on a regular basis.

(b) *Library:* The Center has a library of catalogues, journals, reference books, AV equipment data books, films, slides, video-tapes and other educational resources.

(c) *Loans of Equipment:* The Center has a variety of AV equipment such as audio/video tape-recorders of various makes and types, 8/16 mm film projectors, slide projectors, overhead projectors, photographic equipment and many other items. Most of these can be borrowed for teaching, research and other similar purposes on a first-come-first-served basis and the borrower is responsible for its collection from, and safe return to, the Center.

(d) *Studio Facilities:* The Center's studio is primarily equipped for TV production work but photography, filming, previewing of films, playback of audio/visual tapes, sound recording, synchronising of slides to sound are some of the activities which can also be undertaken.

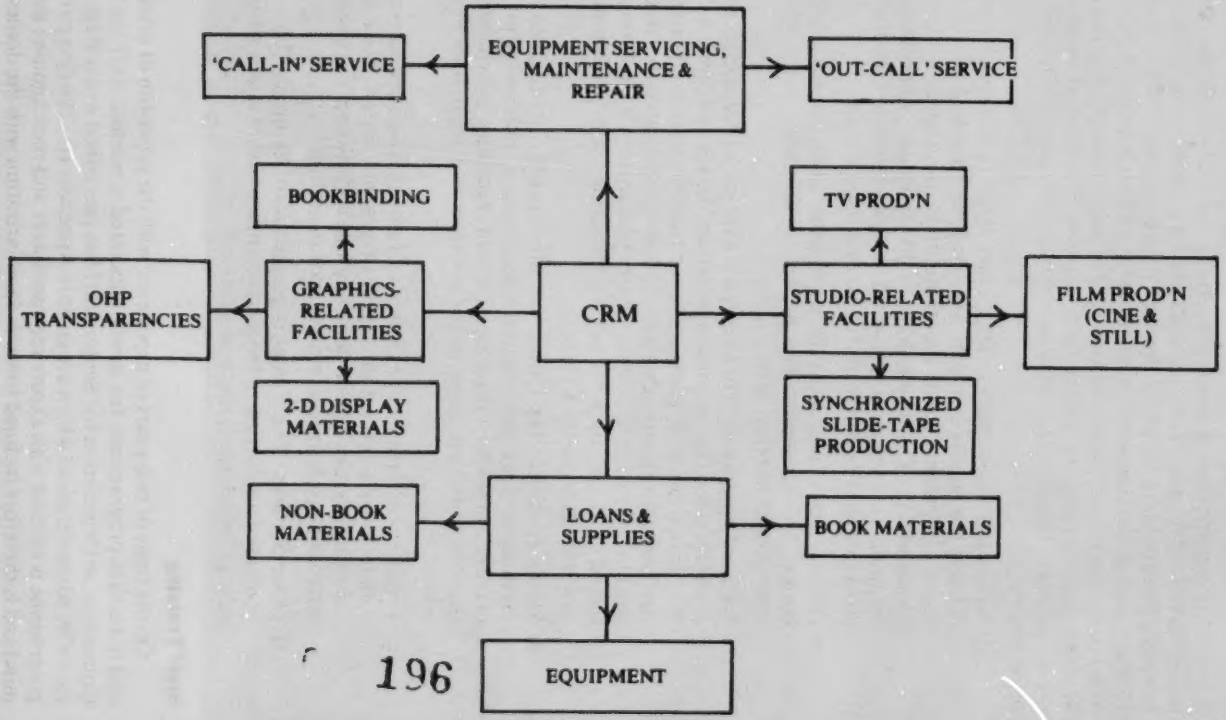
(e) *Visual Presentation:* The Center's Graphic section provides a fairly comprehensive service in respect of graphic design, book layout, transparency making and book binding, and also advises on printing requirements, hotpress printing and lamination.

(f) *Other Services:* The Center is pleased to offer upon request short courses of instruction in the use and application of audio visual technology for academic and technical staff.

Staff Training

On the basis of two years of experience with the provision of orientation and induction programmes for newly appointed academic staff the Senate Committee on Orientation for Senior Staff has prescribed a two-stage course for 1979/80 the details of which are given in Appendix III. The first part of the programme is offered with expatriate appointees and their spouses mostly in mind and is therefore inclined towards familiarization with the domestic and administrative facilities of the university and also with the cultural setting of Hongkong itself. It is the second part which is most directly concerned with problems of teaching, learning and assessment in the university and is the

CMR SERVICES



critical point of departure from which the university is likely to extend its tertiary teaching studies and services in the years to come.

By 1983 the CMR will have been re-accommodated so that it will be in a position to increase the carrying-capacity of its services well above present levels: including, in all probability, the addition of mobile television recording facilities to complement those of the studio.

Meantime, the University Senate is shortly expected to review its tertiary teaching service commitments and to decide upon the extent to which it is willing to endorse the expansion of *staff development programme* across the 1981-1984 triennium. If the service *is* to be extended significantly then two courses of action appear to be open to it. The first is to broaden the terms of reference of the Committee on Senior Staff Orientation to cover on-going programmes for established as well as newly-appointed staff. And this might involve the appointment of a *co-ordinator for tertiary teaching studies and services:* a measure which would place us in close comparability with the Chinese University of Hongkong which already has an *instructional development officer* who is supported by, and answerable to, a Senate Committee on Instructional Development. Terms of reference which might be envisaged for such an appointee are drafted in Appendix IV.

A second course of action might be to establish a Tertiary Teaching Unit which would operate as a more independent force within the university or be incorporated in, for example, the School of Education. If a cautious doctrine of gradualism is to prevail then it seems the former of these two options — or some variant of it — is the most likely to emerge.

Conclusion

I welcome, on behalf of the University of Hongkong, the initiative taken in the convening of this conference and look forward to those new levels of activity and awareness in the field of teaching and learning processes which ought to flow from our exchange of information and ideas. I note that, originating from within our host country, the idea of founding an ASEAN University has been mooted. If this institution comes into being then it seems not inappropriate to suggest that, within its structure, there should be established a *Center for the Advancement of University Teaching and Learning in South-East Asia.* Should this arrangement not be possible for the foreseeable future, then we might alternatively consider attaching such a Center to another institution already in being in the Region — perhaps operating under the auspices of, or in close liaison with, the Association of South-East Asian Institutions of Higher Learning (ASAHIL).

APPENDIX I

TARGET STUDENT NUMBERS FOR THE TRIENNIUM 1978-81

Figures for the Triennium allow for neither wastage nor repeating. Engineering figures allow for 25 additional second-year places for Polytechnic transfers

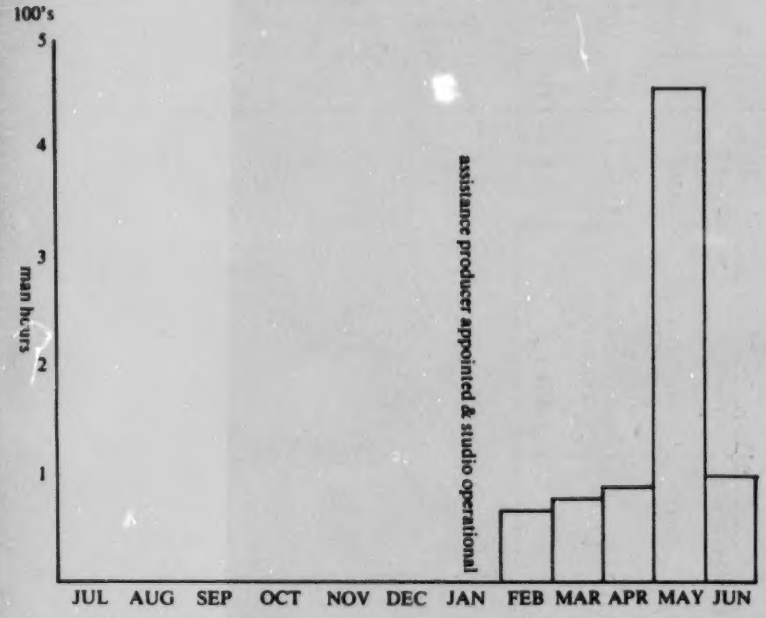
		1977-78	1978-79	1979-80	1980-81
ARTS	I — B.A.	286	365	365	365
	II — B.A.	287	286	365	365
	III — B.A.	289	287	286	365
		862	938	1,016	1,095
	H.D.	90	96	116	116
EDUCATION	Cert.Ed.	203	231	296	336
	H.D.	18	30	30	30
SOCIAL SCIENCES	I — B.Soc.Sc.	204	270	270	270
	II — B.Soc.Sc.	202	204	270	270
	III — B.Soc.Sc.	200	202	204	270
		606	676	744	810
	H.D.	90	97	107	107
LAW	I — LL.B.	57	55	80	80
	II — LL.B.	45	57	55	80
	III — LL.B.	44	45	57	55
		146	157	192	215
	P.C.LL.	35	40	45	50
	H.D.	7	6	6	6
SCIENCE	I — B.Sc.	179	220	220	220
	II — B.Sc.	175	179	220	220
	III — B.Sc.	177) 3)	182	187	225
		534	581	627	665
	H.D.	43	49	49	49
MEDICINE	I — M.B., B.S.	150	150	150	150
	II — M.B., B.S.	155	↓	↓	↓
	III — M.B., B.S.	154			
	IV — M.B., B.S.	150			
	V — M.B., B.S.	186			
		795	750	750	750
	H.D.	20	24	29	29
DENTISTRY	I — First Year	—	—	—	80

			1977-78	1978-79	1979-80	1980-81
ENGINEERING	I — B.Sc.(Eng.)		236	230	245	245
	II — B.Sc.(Eng.)		234	261	255	270
	III — B.Sc.(Eng.)		214	234	261	255
			684	725	761	770
	H.D.		60	81	93	93
ARCHITECTURE	I, II, III	B.A.(A.S.)/ B.Sc. (B.Sc.)	50	55	55	55
			49	50	55	55
			52	49	50	55
	IV — B.Arch.		33	27	25	26
	B.Building		—	25	24	24
	V — B.Arch.		35	33	27	25
			219	239	236	240
	H.D.		13	14	22	24
CHINESE LANGUAGE	Dip./Cert.		20	10	10	10
	Others		15	5	5	5
			35	15	15	15
URBAN STUDIES	Master's		—	—	—	20
5,134 5,500	GRAND TOTALS		4,460	4,749	5,134	5,500
	H.D. TOTALS (Ex. P.C.LL.)		341	397	452	474
	1ST YEAR U/Gs		1,162	1,345	1,385	1,465
	TOTAL U/Gs (Ex. P.C.LL., B.Arch., B.Bldg.)		3,776	3,981	4,250	4,550

APPENDIX II

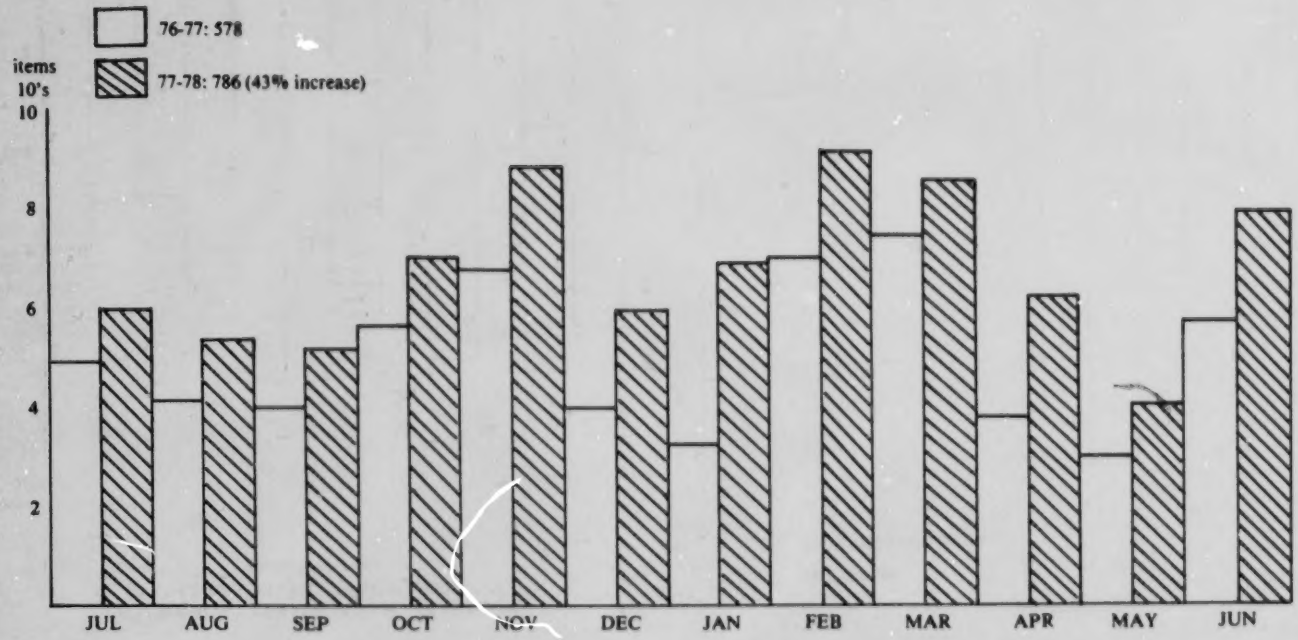
1977-78 STUDIO PRODUCTION FACILITIES: DEPARTMENTAL USE IN TOTAL CMR MAN HOURS

does not include programme producer's consultation time

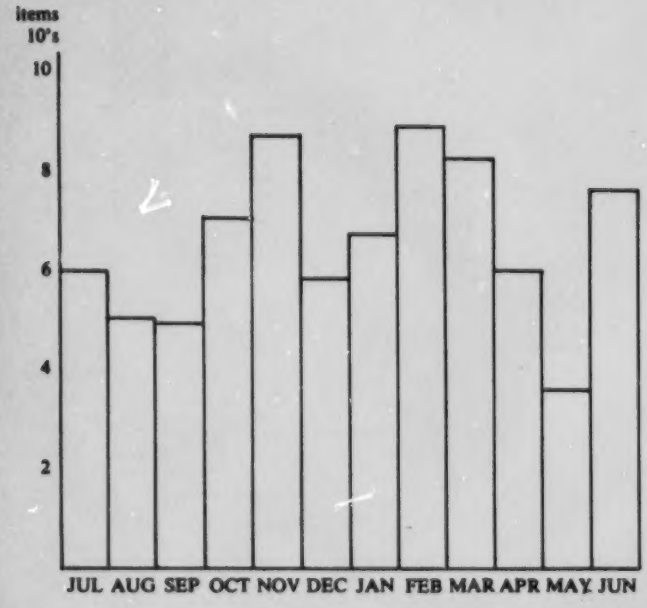


dept.	man hrs.
EDUCATION	305
LANGUAGE CENTER	72
MANAGEMENT STUDIES	56
PEDIATRICS	50
GEOGRAPHY	48
PHYSICS	28
CHEMISTRY	27
LAW	20
LIBRARY	4
total	610

SHORT TERM LOAN OF EQUIPMENT BY CMR
TO DEPARTMENTS IN THE UNIVERSITY



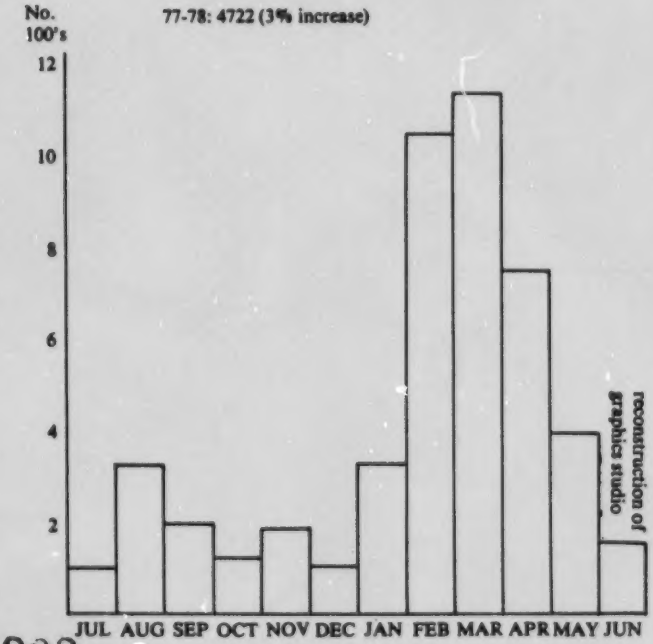
1977-78: SHORT TERM LOAN OF EQUIPMENT
BY CMR TO UNIVERSITY DEPARTMENT
(monthly totals)



1977-78: OHP TRANSPARENCIES (quantity)

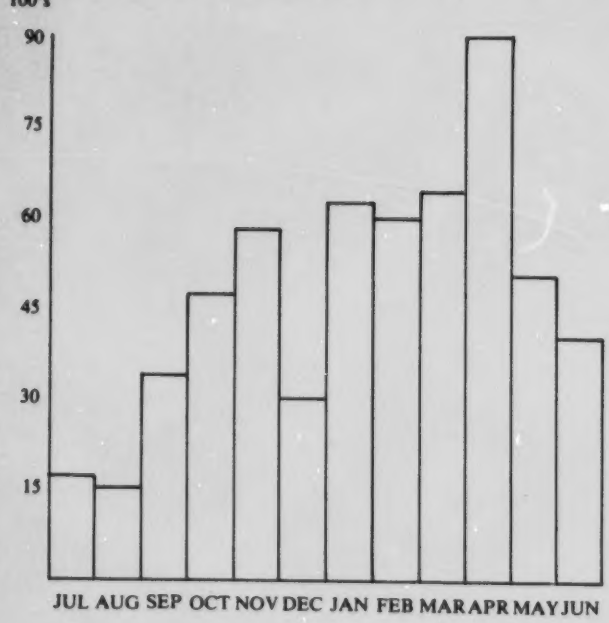
76-77: 4596

77-78: 4722 (3% increase)



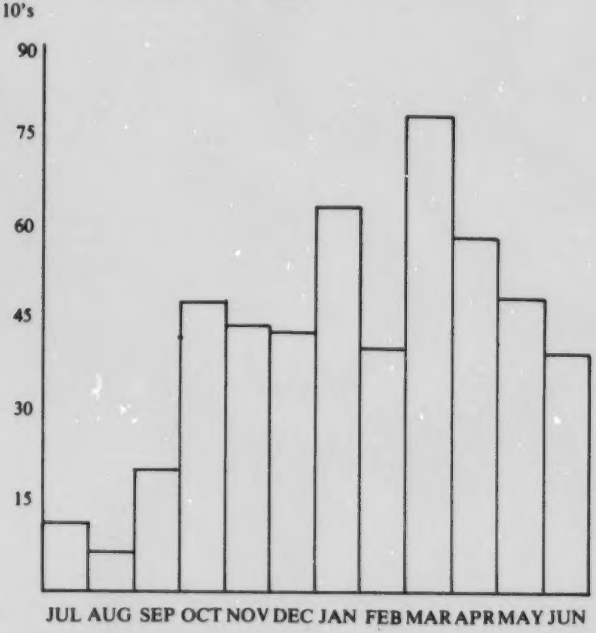
1977-78: PHOTOCOPYING IN CMR
(quantity)

76-77: 43361
77-78: 56260 (29% increase)

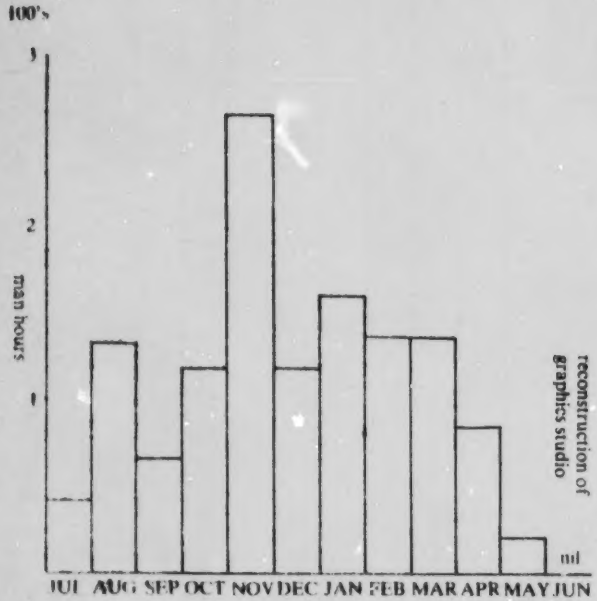


1977-78: BOOKBINDING (quantity)

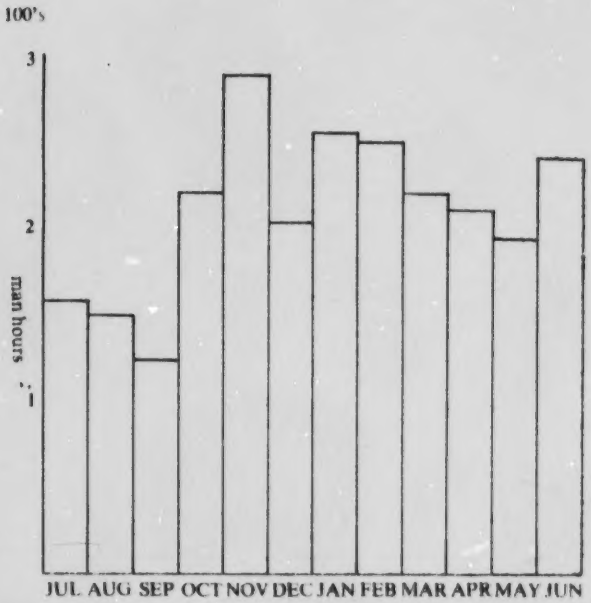
76-77: 1889
77-78: 4803 (154% increase)



1977-78: GRAPHICS PRODUCTION



1977-78 REPAIR & MAINTENANCE BY CMR OF AV EQUIPMENT
(routine inspection & testing time not included)

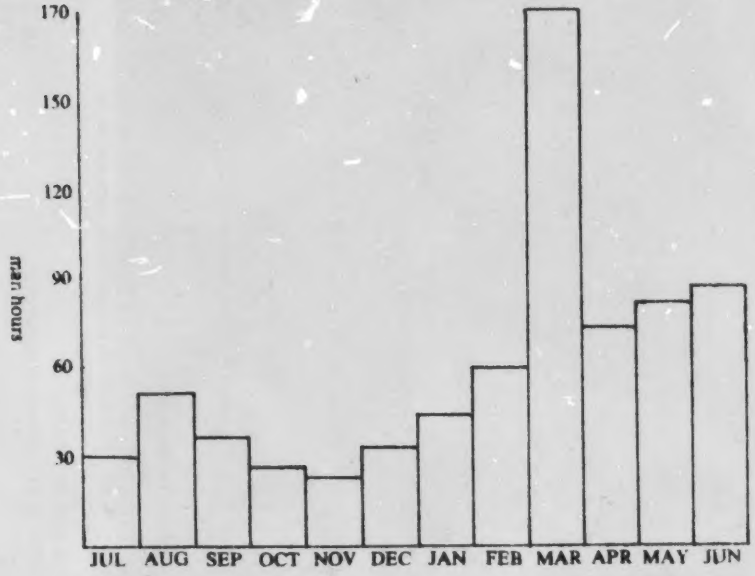


1977-78: PHOTOGRAPHY — prints, slides & processing

76-77: 182

77-78: 629 (Sept.–June only for comparable periods)

(245% increase)



APPENDIX III

UNIVERSITY OF HONGKONG
COMMITTEE ON SENIOR STAFF ORIENTATION

ORIENTATION PROGRAMME FOR NEW APPOINTEES 1979

All meetings will be held in the Mellor Room, Senior Common Room, unless otherwise specified.

Part 1A Introduction to the University and to Hongkong
(For new appointees and their spouses)

Monday September 3 1979

Morning	Chairman: Mr. P.M. Whyte	
9.30 — 9.45	Welcoming Address	Vice-Chancellor
9.45 — 10.30	Structure, Administration & Organization of the University	Mr. M.G. Spooner, Deputy Secretary
10.30 — 11.00	Coffee	
11.00 — 12.30	Forum: Salaries, Superannuation & Taxation	Mr. I.A. McKenzie, Senior Assistant Secretary (Finance)
	Housing and Housing Maintenance	Mr. J.C. Markey, Estates Officer
	Conditions of Service	Mr. M.H. Barry, Senior Assistant Secretary
12.30 — 2.00	Lunch Break	
Afternoon	Chairman: Mr. A.R. Marsh	
2.00 — 3.00	The University Health Service	Dr. I.F. Osmund, Director of the University Health Service
3.00 — 4.30	Forum: The Academic Staff Association	Mr. S.N.G. Davis, Chairman of the ASA Committee
	The Staff Sports Club	Dr. K.C. Lam, Chairman of the SSC Committee
	The Senior Common Room	Dr. P.S.S. Lau, Chairman of the SCR Committee

Tuesday September 4 1979

Morning	Chairman: Mr. K.C. Fok	
9.30 — 10.30	Problems of, and advice for, new arrivals to Hongkong	"a wife"
10.30 — 11.00	Coffee	
11.00 — 12.30	Schools in Hongkong	Mr. C.J.G. Lowe, Lecturer in Education
12.30 — 2.00	Lunch Break	
Afternoon	Chairman: Dr. M.P. Sammes	
2.00 — 3.00	An Introduction to Chinese Culture	Dr. M.W.M. Lau, Curator, Fung Ping Shan Museum
3.00 — 4.30	An Introduction to the University Libraries	Mr. M. Quinn, Deputy Librarian
	the Language Centre	Professor R. Lord, Director
	Extra-Mural Studies	Mr. R.A. Williams, Director
	Center for media Resources	Mr. P.A. Cooke, Director
4.50 — 5.30	Sherry Party	

Part 1B The University Student and the Resources of the University
(For new appointees only)

Wednesday September 5 1979

Chairman: Mr. K.J. Fukuda

2.00— 3.00	The background of HKU students	Mr. L.S.K. Wong, Assistant to the Dean of Students/Mr. C.J.G. Lowe, Lecturer in Education
3.00 — 4.00	Language & communication problems	Professor R. Lord, Director of the Language Centre/ Mrs. H.K.Y. Chan, Student Counsellor

Thursday September 6 1979

Chairman: Dr. P.J. Preston

2.00 — 3.00	Work of the Office of Students Affairs	Mr. P.M. Whyte, Dean of Students
3.00 — 4.00	The University Counselling Service	Mr. N.W. Briers, Senior Student Counsellor

Friday September 7 1979 (Meet in the seminar room in the Main Library at 2.00 p.m.)

Chairman: Miss L. Chung

Visit to the Main Library	Mr. M. Quinn, Deputy Librarian

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UNIVERSITY OF HONGKONG

COMMITTEE ON ORIENTATION FOR SENIOR STAFF

ORIENTATION PROGRAMME FOR NEW APPOINTEES 1979

PART II UNIVERSITY TEACHING

DECEMBER 17 to DECEMBER 21 1979 (One full day, four half days)

Monday December 17 1979 (The Mellor Room)

Chairman: Professor W.A. Reynolds

9.15 — 9.45	General Introduction (The purposes of education in a university and the skills and attitudes required of its teachers) Speaker: Professor J. Aitchison, Department of Statistics
9.45 — 10.30	The Work of University Teachers (Representatives of different disciplines present aspects of the work of university teachers, highlighting their own problems and the solutions they adopt) Panel Members: Professor A.C.L. Hsieh, Department of Physiology Professor D.M.E. Evans, School of Law Professor M.C. Groves, Department of Sociology
10.30 — 11.00	Coffee
11.00 — 12.30	Discussion Groups (New staff grouped in related disciplines discuss the issues raised in the previous session as they apply to their own teaching subjects) Panel members (as above) to act as discussion leaders.
2.00 — 4.00	The work of the Student Counselling Unit Speaker: Mr. N. Briers, Senior Student Counsellor.

Tuesday December 18 (The Mellor Room)

Chairman: Mr. P.M. Whyte

9.30 — 10.30	Principles of Learning (An introductory lecture) Speaker: Professor M.A. Brimer, School of Education
10.30 — 11.00	Coffee
11.00 — 12.30	Course Design Principles Speaker: Mr. P.D. Reynolds, School of Education

Wednesday December 19 1979 (Center of Media Resources)

9.30 — 10.30	Audio-visual Aids (An illustrated talk) Speaker: Mr. P.A. Cooke, Director of the Center
10.30 — 11.00	Coffee
11.00 — 12.30	Guided Preparation Session (Participants prepare teaching aids for their own use)

Thursday December 20 1979 (Center for Media Resources)

9.30 — 10.30	An Introduction to Microteaching Speaker: Mr. A.E. Sweeting, School of Education
10.30 — 11.00	Coffee
11.00 — 12.30	Guided Preparation & Presentation Session (Participants are invited to present a short unit of teaching (5-10 minutes) to their colleagues. This will be video-recorded for playback and discussion) Assistance from members of staff of the School of Education.

Friday December 21 1979 (The Mellor Room)

Chairman: Mr. A.R. Marsh

9.15 — 10.30	Evaluation & Assessment (Different assessment techniques, formulation of examination questions, examination strategies, continuous assessment) Speakers: Professor M.A. Brimer, School of Education Dr. P.T.K. Tam, School of Education Dr. F.H. Allen, Department of Chemistry
10.30 — 11.00	Coffee
11.00 — 12.30	Plenary Session (Discussion with participants. Programme evaluation)

Possible terms of reference for a *co-ordinator of tertiary teaching studies and services* in the University of Hongkong.....

Internal Consultancy

The co-ordinator shall explore, with departmental and faculty heads, the nature of unmet needs in teaching and learning within their particular units and shall offer specific programmes of assistance within the limits of available resources and personnel available to him in the university. Collaborative efforts between the School of Education, the Center for Media Resources, the Language Center, the Computer Center, the Center for Asian Studies, the Department of Extra Mural Studies and the Library, will be essential to the effect support of such activities, and it is the responsibility of the co-ordinator to forge appropriate links between these centers in the formulation of specific programmes.

External Consultancy

The co-ordinator's functions shall not be limited solely to problems of teaching and learning *within* the University. He shall, by means of correspondence, personal visits and selective purchases, monitor developments elsewhere in the world concerning the enhancement of teaching and learning processes at the tertiary level. He shall direct information thus gathered to those members of the university's senior staff for whom such information may be most relevant. In addition, he will foster and maintain close ties with his local counterparts in the Chinese University of Hongkong and the Hongkong Polytechnic with a view to the periodic convening of between-institution seminars and conferences having, as their basis of inquiry, common problems of teaching, learning, and assessment at the tertiary level in the Hongkong milieu. From time-to-time, where appropriate, and where funding can be secured, he will assist the Dean of The School of Education in the short-term commissioning of expertise from overseas as part of the effort to increase insight into problems of teaching and learning within universities.

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SUPPORTIVE INFRASTRUCTURE, ACADEMIC STAFF TRAINING AND THE USE OF EDUCATIONAL TECHNOLOGY FOR DEVELOPING EFFECTIVE TEACHING — LEARNING PROCESSES

by
G. Rex Meyer Ph.D.
Director
Centre for Advancement of Teaching
Macquarie University
North Ryde NSW 2113
Australia

Abstract:

Most academics are conservative in regard to teaching. This is due to several factors including commitment to 'pure' research and pursuit of a discipline. Nevertheless, there are factors tending to cause change and innovation. These include changing expectations of students and of the society, diversification of tertiary systems and the influence of educationalists and trainers in the role of change agents. There have been, in recent years, several innovative trends in university teaching including more effective applications of educational technology and experiments in personalized learning. These trends can become foci for further change.

To have impact, staff development activities should satisfy known conditions for effective learning. They may take any number of forms including short courses and workshops, consultancy and counselling services, seminars and lectures, use of printed materials and training kits, conferences, exchanges and visits, and provision of facilities for production of learning materials.

Several alternative administrative infrastructures are available for the administration of staff development programs. These range from programs run by individuals and committees to fully independent and adequately staffed centres or units with wide ranging responsibilities for the improvement of teaching and learning. Each of these types of infrastructure has its advantages and its disadvantages and can satisfy a certain range of needs.

Given appropriate resources and finances the optimal model would appear to be an independent University Education Center with four areas of related functions; A-V technology; staff training; continuing education and research. These functions should be developed in balance and should be interactive. The continuing education element could generate funds for the Center as a whole through the sale of materials and services to the community at large. The A-V component is especially important as it gains early acceptance, provides a valuable resource for all aspects of the work of the Center and is a stimulus for campus-wide innovation. Educational technology has a special role in staff training as it provides a credible, systematic, fail-safe basis for the achievement of clearly defined goals. It is an appropriate base for the design and presentation of training courses and leads to opportunities for the application of the principles of behavioral psychology.

To be fully accepted and effective staff development activities should be based on an optimal infrastructure and be highly systematic in design and presentation.

Introduction

1. The Need for Change Agents

The term "staff development" means different things to different categories of people. In the business world it frequently relates to 'personal

development' and especially to the growth of individual attributes and skills relevant to the continued development and/or organizational renewal of the total company or institution. In universities, the term usually refers to the development of individual understandings, attitudes and skills relevant to the teaching-learning process. In the case of universities staff development may or may not be part of a program of organization renewal for the whole campus or for a given department.

In the business world, programs of staff training and development are usually "built in" as *essential* components of organizational structure and policy. The commercial world recognizes that its objectives, which are usually in terms of gaining increased profits, can be attained only by programs of staff training which ensure that all steps leading to planned outcomes are efficient and effective. In universities this attitude is rare.

In almost all areas relating to teaching, other than scholarly development and analysis of the content of a teaching discipline, a university lecturer is essentially conservative. This conservatism is due to several factors not the least of which is the lack in most instances of formal pre-service training in teaching. Most university teachers learn on-the-job, usually by observing the methods of colleagues. They, therefore, perpetuate the past and have little knowledge of, or interest in, exploring alternatives. The extent or intensity of this attitude, however, varies from discipline to discipline. It is of interest that the more successful of the earlier programs of staff development in universities have been in applied disciplines such as Medicine, Dentistry and Engineering (Abercrombie, 1970; Beard, 1972). The least successful have been in lthe liberal arts especially in areas such as History, Language Arts and Mathematics. There is an explanation for this. Within the liberal arts curriculum there is a long tradition that the lecturer not only develops and practices his or her discipline but teaches it as well. An historian is also a teacher of history. A medico, however, is not *per se*, a teacher of medicine. A medico is secure in the knowledge that social status and professional recognition come with practice alone and that teaching is merely an 'additional' skill that comes only because of an 'additional' need. The medico, therefore, has no qualms in admitting a need for help in developing teaching skill. An historian, on the other hand, may feel threatened by such an admission. Because the discipline and the teaching of the discipline are so closely inter-related, such an admission by the history lecturer is tantamount to an admission of incompetence; almost to the point of admitting that he or she should not have been appointed in the first place.

Other factors tend to produce conservative attitudes in regard to teaching. These include dedication to research and scholarship; the publish or perish syndrome; failure by administrators to give due recognition to teaching contributions as a criterion for promotion; certain 'in-built' traditions and expectations signalled through block timetables, and grading systems and by the use of terms such as 'lecture', 'lecturer', 'lecture hall', 'tutor' and the like; an absence of opportunity for training and/or lack of up-to-date information about teaching and learning; some degree of apathy; prejudice towards the validity of the work of educationalists; and a traditional community image of the university as a conservative bastion of knowledge and as a guardian of past values.

Figure 1 summarises these factors but also indicates forces operating to bring about change and innovation.

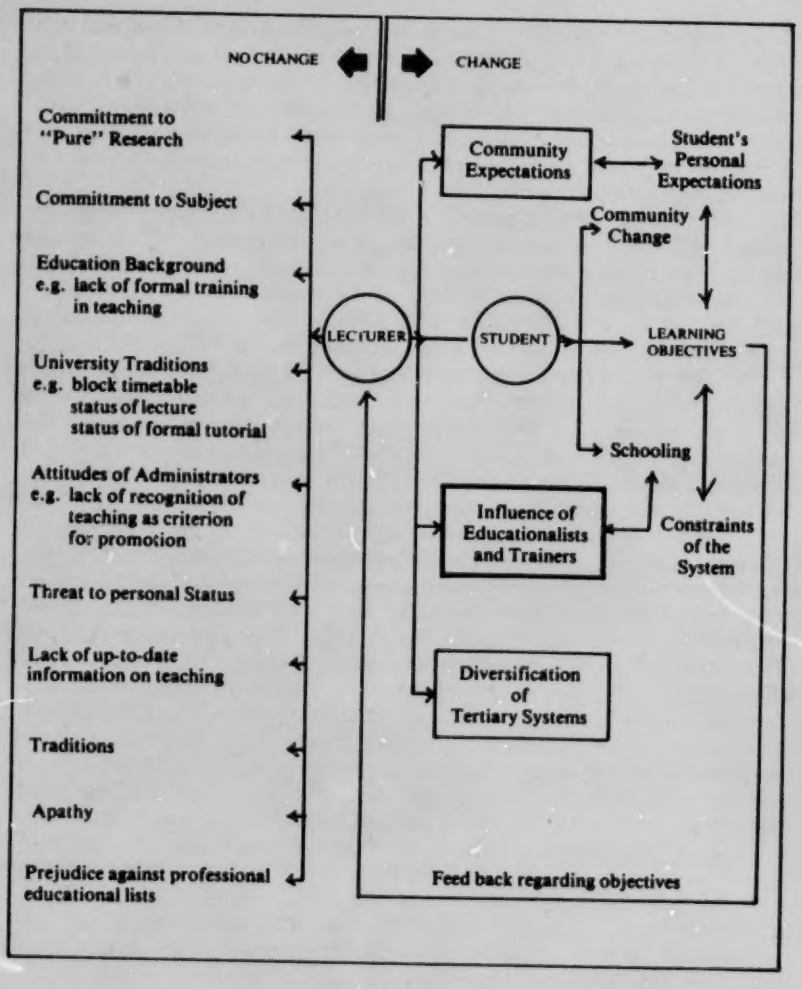


FIGURE 1

SOME FACTORS INFLUENCING UNIVERSITY LECTURERS TO BE EITHER CONSERVATIVE OR INNOVATIVE IN TEACHING

The main factor likely to encourage the university lecturer to be more innovative is the student. Each student has his or her own learning objectives which are a personal interpretation of the objectives laid down (either overtly or covertly) by the lecturer in charge of each course. This personal interpretation by the student is in turn influenced by his own and by community expectations. Interpretation and realization of the learning objectives is also moderated by practical constraints of the system. So the lecturer "receives back" from the student a considerably 'distorted' interpretation of his (the lecturer's) original intent. This filtering and distortion of learning objectives by students is a challenge to the lecturer. When the mismatch reaches serious proportions then the lecturer is challenged to rethink his/her whole program. But students are also influential in other ways. They are sensitive to and reflect community change. They have come from a secondary schooling which is responsive to recent trends in curriculum and teaching method. They become impatient with the lecturer who mirrows outmoded social values and whose educational practise reflects content, strategies and methods of past years. In today's world, students have no hesitation in voicing dissatisfaction with fustian values and outmoded teaching practise. What greater pressure could be brought to bear on the lecturer than this? Innovate or suffer student ridicule; keep-up with the times or be regarded as an educational fossil.

Other factors likely to influence a university lecturer to be innovative, include increasingly sophisticated community expectations. While most members of the community may believe universities to be centers of tradition and of formal academic scholarship, an increasingly vocal minority is demanding a change towards greater social relevance. Associated with this trend is the development of more diverse forms of tertiary institutions — polytechnics, colleges of further education, technical colleges, adult education centers, community development networks — and the like. Universities are no longer the one and only centers for study beyond secondary school. They now have keen competitors. This is very salutary for the traditional university teacher — he/she must adapt or perish!

Refer again to figure 1. There remains one further category of influence — namely the work of educationalists and trainers. This influence is both direct and indirect through their influence on students (impact on schooling) and on the pattern of post-secondary education. Nevertheless, the figure indicates that the influence of educationalists and trainers is only one factor among many that could affect a lecturer's attitude towards, say, the improvement of teaching.

Resolution of conservative and innovative forces shown in figure 1 determines the attitudes and policies of any given lecturer. The task of a staff development program is to minimize the influence of conservative factors and maximize the effect of innovative factors. The role of the educationalist, whether as a consultant, trainer or organizational and group facilitator, is vital in this regard. It is probably the only factor among the many shown in figure 1 that can be systematically controlled and manipulated to effect maximum innovation. The question remains — what is the optimal structure for organizing and effecting the work of educationalists and trainers in their role as agents of systematic change?

2. Some Trends in University Teaching

During the past twenty years factors leading to the improvement of university teaching have become more operative and effective than perhaps at any previous time since the European Renaissance. Rapid recent changes in schooling, the more sophisticated demands of society and the steady advances made by educationalists in understanding the processes of teaching and learning, have contributed to this. Unfortunately, however, the impact of these factors has been uneven. Most universities have yet to face what the business world takes for granted — namely the need for total systematic programs of organization development involving continual growth and renewal of all elements of their policy, structures, and practise. The extent of improvement in teaching varies from campus to campus, from department to department and from individual to individual.

Nevertheless, from campus to campus, here-and-there, with this individual or that, it is possible to identify changes in policy and practise and these changes add up to some fairly wide-spread trends. These trends are summarised in figure 2.

1. **Redefinition of aims**
   University education more socially relevant. More courses geared to immediate vocational needs.

2. **More systematic course design**
   Systems model more widely employed; objectives — input — process — output — assessment — evaluation — feed back.

3. **Greater emphasis on objectives**
   Greater appreciation of need for clarity of objectives in both course design and in presentation.

4. **Application of educational technology**
   More rigorous application of systems approach, behavioral psychology and systematic design and production of resources.

5. **Modification of large group teaching**
   The traditional 'lecture' more frequently modified as an interactive large group activity with a greater emphasis on participation.

6. **Diversification of group methods**
   The traditional tutorial frequently replaced by more varied approaches to small group work — teacherless groups; simulations; problem-solving groups, etc.

7. **More effective use of A-V technology**
   More effective and efficient use of a wider range of audio visual resources, including simulation games.

8. **Alternative use of time**
   Development of continuous access learning stations and other approaches to the relaxation of traditional constraints of the timetable.

9. **Alternative utilization of staff and space**
   Experiments with open space teaching, learning centers, team teaching and individualized learning stations.

10. **Experiments in personalized learning**
    Further use of programed resources, audio-tutorials, contract methods, Keller Plan and other forms of individualized learning.

11. **Evaluation of courses and teaching.**
    Use of more systematic approaches to the evaluation of teaching involving convergent evidence from a variety of sources.

12. **Greater involvement with community**
    Extension of experiential learning; continuing education programs and involvement in community development projects.

FIGURE 2

TWELVE RECENT TRENDS IN UNIVERSITY TEACHING

Trends such as these are important for staff development. They provide focal points for training through case study analysis, work with innovative staff and as exemplary models.

3. Staff Development Activities

Effective staff development programs must be carefully planned. The informal contact-seeding of an idea through casual conversation — certainly can bring about some change, but it is by no means sufficient. Staff development must be sustained and systematic to have significant impact on the quality of teaching in an institution such as a college or university. Ideally, it should be integrated into a total program of organization development for the institution as a whole or at second best, for a single department within the institution. Programs of organization development, however, are rare in universities. University lecturers are highly idiosyncratic, with intense loyalty to the frontiers of their discipline. These frontiers are lonely places and it is not always easy for university staff to perceive all elements of the complex interactions of a total organization or to be sensitive to the need for organizational renewal. But whether or not staff development is associated with programs of organization development, it is a form of *learning* and to be effective must meet the conditions necessary for effective learning, especially adult learning. Almost all forms of staff development, whether they be centrally organized training courses, consultancy services, staff seminars, conferences or whatever, should meet as many as possible of the conditions of learning as set out below (figure 3).

All Staff development activities should meet as many as possible of the following conditions of learning:

i) Meet a definite identified need
ii) Have clearly defined objectives
iii) Have immediacy of application
iv) Be carefully structured in relation to objectives and strategies
v) Include relevant but varied strategies, methods and media
vi) Be based on activity
vii) Have a skills orientation
viii) Utilize well designed, relevant, learning resources
ix) Involve participants in planning and operation of each activity
x) Draw on the expertise and experience of participants
xi) Provide participants with continuous feedback on progress
xii) Provide reinforcement at all relevant points of achievement
xiii) Cater for differences in interests, backgrounds and needs
xiv) Provide models for procedure and presentation
xv) Make all processes and procedures overt
xvi) Provide contiguity of elements
xvii) Utilize the special qualities of group dynamics
xviii) Pose alternatives
xix) Include self direction
xx) Encourage self assessment
xxi) Include subtle forms of repetition
xxii) Be sufficiently flexible for integration into a total program
xxiii) Provide for follow-up
xxiv) Provide for immediate and longer term evaluation of effectiveness.

FIGURE 3

THE QUALITIES OF EFFECTIVE PROGRAMS OF STAFF DEVELOPMENT

An important issue is the question of the optimal training format for staff development. Are centrally mounted courses and workshops more or less effective than courses mounted within single departments; are programs of counselling and consultancy generally useful; do publications and training modules have a role, and so on?

This issue can only be resolved by a consideration of both purpose and availability of resources. The following discussion identifies some forms of staff training and considers their possible roles.

i) **Centrally organized short courses and workshops**

These are especially useful for development of generally applicable teaching skills and competancies. They can also be used to heighten awareness and to encourage positive attitudes and values in relation to teaching improvement. They have the special advantage of bringing together staff members with different backgrounds and experience to consider problems issues and skills of common interest and concern. This aspect can be further enhanced if such courses are also open to participants from other universities and educational institutions. Central courses, however, have the disadvantage of being out of context. Participants returning to their departments may be unable to effect change or to implement newly acquired skills because of attitudes or practical constraints within those departments. A further disadvantage is that the training is not totally focused on the particular discipline of each member of staff and therefore, may appear to some, especially to those not attending, to be irrelevant to their needs and professional interests.

ii) **Courses and Workshops within departments**

This format permits training to focus on the specific needs of a department and on the specific requirements of a discipline. There is more likelihood that newly acquired skills will be applied as most members of staff become involved in the training. It is also more likely that a program of change will be sustained. Another advantage is that this approach is likely to involve many members of staff who would not otherwise be contacted by any other form of training. The main disadvantage is that the approach is labour intensive. Even self-initiated improvement programs by the departments themselves require facilitation by external "change agents" and few universities can afford the luxury of staff development officers for each separate department. Usually a centrally appointed staff development team is required, but such a team can work only with a limited number of departments at any one time. Many departments may have to wait in a queue for their turn at a training program.

iii) **Consultancy on Specific Issues**

Consultancy is useful and indeed, frequently necessary, for the solution of specific problems in teaching identified by an individual, a department, or by the institution as a whole. It is essentially a process involving close human interaction and is best co-ordinated by a

team within an organizational context, say within a teaching department of the university. If consultancy is linked to a program of organization development it can lead to sustained and continually unfolding programs of growth and renewal. There is the disadvantage, however, that it is labour intensive and there is a danger that consultants may be used merely for 'fire fighting' — to provide quick solutions to immediate difficulties rather than to help identify and solve fundamental and deep-seated problems. Another difficulty is that some members of staff may look to consultancy services as the only source of development and may abdicate from the responsibility of initiating change and innovation.

iv) **Diagnostic Counselling**

Counselling is essentially one-to-one consultancy. It usually focuses on the identification and 'treatment' of particular problems and difficulties and helps to identify and utilize strengths and positive attributes.

A widely used technique is to compare self-evaluative data with data from other sources such as comments and ratings by students. Counselling has the special advantage of leading to individually prescribed programs of development. It has the disadvantage of being labour intensive and also has a danger of alienating the co-operative member of staff from his or her less receptive or responsive peers. There is the further disadvantage that it must rely entirely on the willingness of an individual to voluntarily seek the assistance of the counselling service.

v) **Seminars and lectures**

This type of approach is a useful method of disseminating information about successful and innovative approaches and case studies. The seminar involves a presentation by a member of staff to a group of his/her peers whereas the lecture may be by a visiting authority or expert and could involve a wider audience. The method has the obvious disadvantage, however, in that it is unlikely to lead to systematic and sustained programs of growth and development.

iv) **Publications**

The production and distribution of newsletters, bulletins, monographs, films, slide-tape programs, video and audio recordings and other resources describing and discussing teaching procedures is a useful, relatively inexpensive and reasonably effective way of disseminating ideas about teaching. This method is especially useful if the publications, and productions describe examples of good teaching, innovations, or experiments with alternative approaches implemented by members of staff. While the approach certainly tends to increase awareness, the disadvantage is that, on its own, it is unlikely to lead to acquisition of new practical skills.

vii) **Production and use of training kits**

Training kits for use by individuals or groups, usually involving a variety of media and co-ordinated with the help of an instruction manual or leader's guide, can be effective both for increasing awareness and in developing skills. Their special advantage is that they can involve staff in practical workshop situations without attendance at formal courses. Their obvious disadvantage is that they are difficult and time-consuming to produce.

viii) **Conferences**

Conferences can bring staff together for a review of a range of teaching concepts and skills. They have the special advantage of focusing attention on particular issues. Guest speakers can also be invited to describe new trends or case studies. Effective conferences, however, require a great deal of organizational effort and have the further disadvantage of being "one-off" events unlikely to lead to sustained programs of change and development.

ix) **Visits, Exchanges, and Study Tours.**

Visits by individuals and open-house days by departments can be useful "on campus" events which help in the dissemination of ideas and experimental approaches to teaching. Visits, exchanges and study tours involving other institutions extend this idea still further. This approach has the special advantage of peer interaction but does need a fair degree of structuring and organization to be fully effective.

x) **Secondments and Internships**

Attachment of a member of staff to a center for university teaching, or to the library or A-V unit, or to another department for a few days, a few weeks or a full semester, is a useful device for the improvement of teaching. Attachments can also be extended to institutions and organizations not on campus. They are especially useful for giving a member of staff an opportunity to break away from normal duties so as to spend time on study or development of some aspect of teaching. This approach may encourage staff to produce new teaching materials, to plan new programs or to develop new strategies. Attachments and secondments, however, present organizational problems, not the least of which is replacement of the members of staff involved. In some cases, however, special scholarships or grants can be made available to meet replacement costs.

xi) **Displays**

Displays of photographs, teaching materials, examples of student work, etc., relating to particular programs or methods of teaching, can have some value in disseminating ideas. The method really works only if there is a continuous series of displays with changing

themes mounted in a fixed central location such as the library. The disadvantages are that preparation of an effective display is laborious and time consuming and there is no easy way of checking on effectiveness.

xii) **Provision of facilities for the production of learning resources**

An important stimulus for innovation in teaching is the provi sion of a central service that provides the technical and professional help required for the production of high quality learning materials. Such a service may incorporate A-V production units but should be staffed by educational technologists who can advise on curriculum issues and on the application of appropriate theories of learning. This type of service encourages staff to develop and utilize innovative resources and leads to experiments with alternative approaches to teaching. It has the disadvantage, however, of high cost for technical facilities together with a need for specialized staffing and a complex organization and administration.

The twenty-four conditions for effective learning listed in figure 3 are unlikely to be satisfied by any one form of the staff development activities described above. Some activities, especially those involving group work and developed within the context of programs of organization development, are most likely to be effective. Nevertheless, a total program of staff development for an educational institution should involve most, if not all, of the types of activities listed above. Some procedures will appeal to and elicit response from certain members of staff, others will appeal to different categories of personnel. More significantly, however, different purposes can be achieved through different forms of activities. An over-all program of staff development must, therefore, involve a continuous, ongoing synthesis of as many of the forms of activities listed above as possible within the practical constraints of the system concerned. A key question follows. What type, or types, of infrastructure are required to achieve and sustain this synthesis of activities? This question is considered in the next section of the paper.

4. Alternative Administrative Infrastructure for Staff Development

Intervention by especially assigned staff in the teaching-learning processes of a university, with the intention of improving the quality of teaching, is an extraordinarily complex and demanding undertaking. It is important, therefore, to develop the type of administrative infrastructure that enables a program of staff development to proceed smoothly, systematically and effectively. The optimal infrastructure should satisfy the following criteria:

1. Provide most opportunity to reduce the influence of factors leading to conservative attitudes towards teaching (Figure 1).
2. Provide most opportunity to enhance factors leading to innovative attitudes with regard to teaching (Figure 1).

3. Enable identification on the campus of innovative trends in teaching (Figure 2) and their utilization in more general programs of change and development.
4. Provide full opportunity for satisfaction of the maximum number of conditions for effective learning (Figure 3).
5. Provide for the implementation of the maximum range of staff development activities as part of a systematic and sustained program of change and development.
6. Allow for realization of maximum potential within the constraints and limitations of the institutional system.

There are, however, some dangers in attempting to improve the quality of teaching through intervention by professional educationalists. With the wrong approach and in the absence of sensitivity and rapport, defensive reactions could occur which may lead to rejection of change and growth. There is a danger, too, of imposing doctrinare solutions or to narrow options through over-structuring and convergence of thinking. It is possible also that professional educationalists may be led astray by the lure of research for its own sake, rather than seeing it as a tool for change and development. The very presence of especially appointed change agents may inhibit individuality and stifle initiative simply because improvement of teaching could be seen as "their job" and not the job of the total staff. There is also the possibility that educationalists may seek and indeed encourage change for change sake and not initiate change as a response to need. The point should be made, therefore, that even given an optimal administrative infrastructure, a program of staff development is unlikely to succeed unless those appointed as change agents are not only technically competent but are deeply sensitive to the needs, interactions, personalities and problems of their staff colleagues. A number of alternatives is available for the administrative infrastructure of a staff development program (Figure 4).

In the first instance the structure may be restricted to the work of individuals, formal groups or committees, or may be organized through the work of a central agency such as a Center for the Development of University Teaching and Learning. Structures may be established within schools and departments or between schools and departments. The question of the role of the Professorial Board or Academic Senate of the university also needs resolution, and decisions regarding the place of the University School or Department of Education are critical. These and related issues are considered below.

Individuals and Informal Groups

Some universities have not established centers or units for the development and co-ordination of staff training. They have, as an alternative, appointed staff development officers to work either entirely within one department (Figure 4 category 1.11) or to function as roving consultants from department to department (Figure 4, category 1.12). The obvious advantages of this approach include the relatively low cost, the informal nature of the activities and the 'low profile' adopted. A further advantage is that the work of

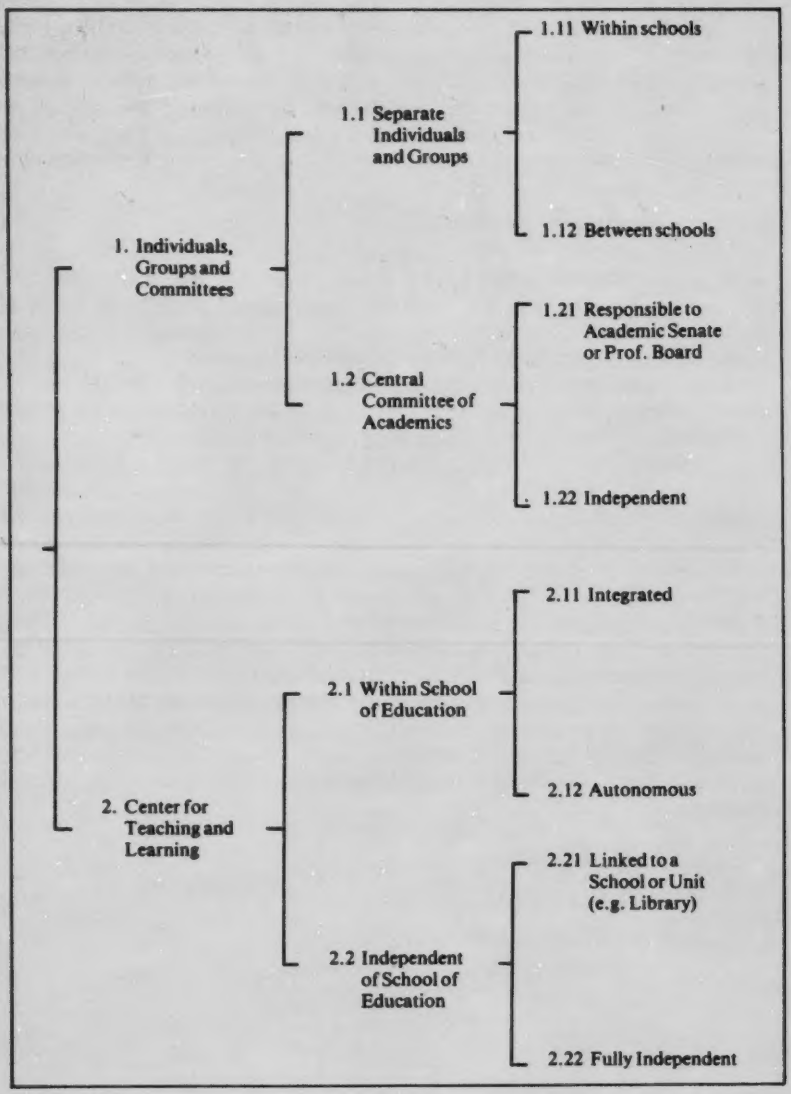

1. Individuals, Groups and Committees
1.1 Separate Individuals and Groups
1.11 Within schools
1.12 Between schools
1.2 Central Committee of Academics
1.21 Responsible to Academic Senate or Prof. Board
1.22 Independent
2. Center for Teaching and Learning
2.1 Within School of Education
2.11 Integrated
2.12 Autonomous
2.2 Independent of School of Education
2.21 Linked to a School or Unit (e.g. Library)
2.22 Fully Independent

FIGURE 4

ALTERNATIVE ADMINISTRATIVE INFRASTRUCTURES FOR STAFF DEVELOPMENT

the staff development officer can be associated more frequently with a departmental program of institutional renewal. The disadvantages include difficulties of co-ordination; lack of access to central resources; possible professional isolation; and the real danger, especially, in the case of the "within-department" appointment, that some members of staff may leave teaching improvement entirely to the staff development officer, abdicating from any responsibility in that area.

Central Committee of Academics

Some universities have attempted staff training entirely through the work of committees consisting of members of the lecturing staff. They have avoided establishing training centers or appointing especially trained staff and have relied on the expertise and experience of peer groups. In some cases such committees may be linked to the academic board of the university (e.g. the Professorial Board or Academic Senate) (Figure 4 category 1.21). In other instances independent committees may be especially established with responsibility only to, say, the Vice Chancellor (Figure 4, category 1.22).

Training through the work of peer groups has the obvious advantages of high levels of acceptance by most staff; low cost; informality, and the direct challenge it provides for staff to accept responsibility for their own training. The disadvantages include lack of access to resources; likelihood that activities will be *ad hoc* and reflexive rather than sustained and systematic and that the programs will be relatively conservative, limited as they must be, to expertise gained through on-job experience rather than by formal training. Committees linked to formal academic boards have the likely special advantage of being most in tune with needs and values of the faculty but have the disadvantage that they may be perceived by more junior staff as the agents of the university bureaucracy. Independent committees, on the other hand, while avoiding the charge of being agents of bureaucracy may be without policy or direction, simply reflecting particular interests and skills of their members.

Centers for Improvement of Teaching, Established Within a School of Education

Most universities, at least in countries such as Australia, Britain, the United States and West Germany, have approached the problem of staff training through the establishment on campus of centers for the improvement of teaching, staffed by educationalists and having explicit terms of reference.

A key question, however, is whether these centers should be part of a university's School of Education or independent of that school. The arguments for linking them to the school of education are as follows. They would have access to the expertise of the educationalists of the School, they would have clear lines of administrative responsibility and could easily obtain relevant materials and technical resources. One model for a center within a School of Education is to fully integrate its functions and staffing into the total program of that School. All appointments would be joint appointments. Staff training functions are then seen as part only of the duties of certain members of staff who would contribute to the normal teaching and research programs of the School. (Figure 4, alternative 2.11). This integrated approach has the special advantage of overcoming the possible isolation of training staff but the disadvantage of the likely development of tensions in the training staff through division of loyalty. A second model for a center within a School of Education would be to opt for virtual autonomy, with separation of functions, budgets and staffing and with the link limited, say, to a line of responsibility from a Director of the Center to the Head of the School of Education. (Figure 4, alternative 2.12). Autonomous units have the advantage of freedom from interference but the disadvantage of potential isolation and stiff competition for resources.

Centers for Improvement of Teaching, Independent of a School of Education

Many universities, while opting for the establishment of a Teaching Improvement Center or Unit, consider that such a center should be administratively separate from the university's School of Education. The advantages of such independence include the following. There is no danger that the center will be seen as biased in favour of the educational profession as such; there is less likelihood that staff development programs will be rejected on the grounds that they are mounted by a School, which in many universities, rightly or wrongly, has a relatively low academic status; and there is more likelihood that its programs will be seen to be balanced and objective. The disadvantages of independence from the School of Education is that resources may be restricted and more competitive and that representation on decision-making bodies of the university is likely to be less effective because of absence of backing by professional colleagues with similar interests and values.

Two models are available for a center established independently of a School of Education. The first (Figure 4, alternative 2.21) is to link it to another service unit such as the library, or even to another academic school, although the latter is rather unlikely. The second (Figure 4, alternative 2.22) is for a fully independent unit, responsible only to, say, the Vice Chancellor. A link with another service unit has the advantage of greater access to the resources of that unit but the disadvantage of possible dominance by, and subservience to, the interests of that unit. Full independence, on the other hand, provides maximum flexibility but has the disadvantage of potential weakness because of the small size or possible lack of access to centers of power within the university as a whole.

Of the eight models of administrative infrastructure described and discussed above, some fully satisfy criteria for optimal effectiveness and others do not. perhaps these criteria could best be restated in the form of two continua: (i) minimum flexibility and least autonomy to maximum flexibility and greatest autonomy; and (ii) limited range of activities to broad range of activities. If these continua are shown as two scales intersecting at mid-point at right angles, it is possible to plot an approximate indication of the relative standing of each type of infrastructure in relation to the variables represented by the continua (Figure 5).

Figure 5 suggests that two of the models (1.11 and 1.21) have potential for only a limited range of activities together with minimum flexibility and autonomy. Three (1.12, 1.22 and 2.21) could develop only a limited range of activities but possess reasonable flexibility and autonomy. Two models (2.11 and 2.12) could lead to a broader range of activities but have relatively little flexibility or autonomy. Only one, the model of the administratively independent Center for the Improvement of Teaching and Learning (alternative 2.22) could have potential for a broad range of activities while maintaining high levels of flexibility and autonomy. The potentials of the various models for the development of the twelve types of staff development activities discussed in part 3 are summarised in Figure 6. Centralized services, and especially a Center for the Development of Teaching and Learning, would appear to have the greatest potential in this regard.

A further point to be considered in relation to infrastructure, is that the models need not be mutually exclusive. It is possible to combine two or more of the models in various ways, for example, an "Improvement Center" working in co-operation with academic committees and/or a team of inter-departmental consultants. Just which model or combination of models may be suitable for any particular university would depend on factors such as the particular needs of the institution; the climate of acceptance; attitudes and values of the administration; availability of resources and above all, the budget available. Another alternative is the development of co-operative programs between various institutions and this raises the further possibility of central units servicing a network of campuses. This approach, however, could be effective only when linked to continuous outgoing programs of organizational development within any of the institutions served by the central unit.

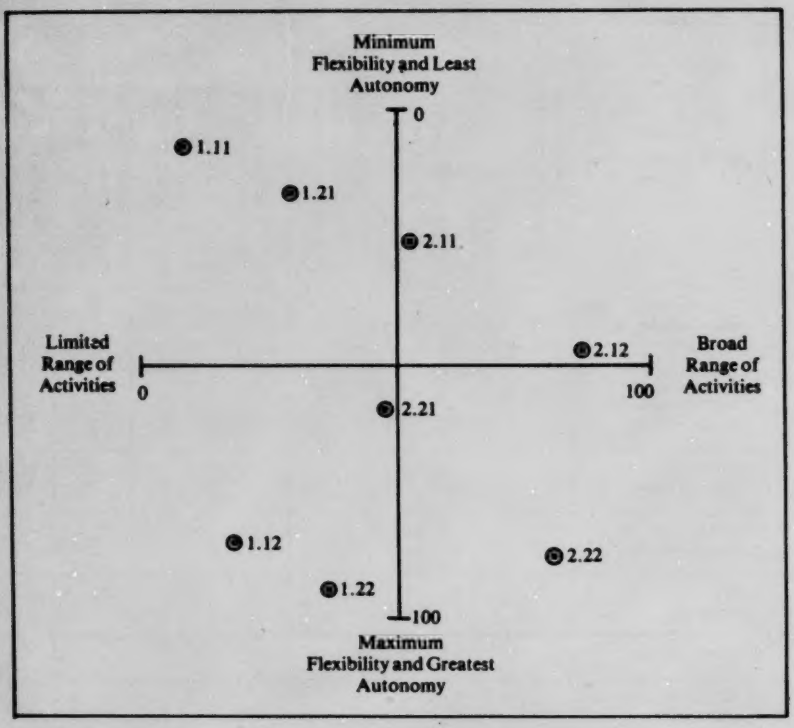


FIGURE 5

THE APPROXIMATE STATUS OF EIGHT ALTERNATIVE MODELS FOR THE ADMINISTRATIVE INFRASTRUCTURE OF STAFF DEVELOPMENT PROGRAMS IN RELATION TO TWO VARIABLES.
For explanation of the code numbers 1.11 to 2.22 see figure 4.

Form of Staff Development Activity	Type of Administrative Infrastructure							
	1.11 Individuals/Teams within Departments	1.12 Individuals/ Teams — Interdepartmental	1.21 A central committee of academics responsible to Academic Board	1.22 A central committee of academics working independently	2.11 A 'Center' integrated within a School of Education	2.12 An autonomous Center within a School of Education	2.21 A center linked to a School or unit other than Education	2.22 An indepenent center
i) Centrally organised short courses and workshops	0	2	2	2	2	3	3	3
ii) Courses and workshops within departments	3	2	1	2	2	2	2	2
iii) Consultancy on specific issues	3	2	1	2	2	3	2	3
iv) Diagnostic Counselling	2	2	1	2	2	3	2	3
v) Seminars and lectures	2	2	2	3	2	2	3	3
vi) Publications	1	1	2	3	3	3	3	3
vii) Productn. & use of training kits	1	1	1	2	2	2	3	3
viii) Conferences	1	1	2	2	3	3	3	3
ix) Visits exchanges and study tours	1	2	2	2	3	2	3	3
x) Secondments and Internships	1	2	2	3	2	3	3	3
xi) Displays	1	1	2	2	2	3	3	3
xii) Provision of production facilities	0	0	1	1	2	2	2	3
Rating	16	18	19	26	27	31	32	35

FIGURE 6

RATINGS (0 to 3) ON LEVELS OF OPPORTUNITY FOR IMPLEMENTATION OF TWELVE FORMS OF STAFF DEVELOPMENT ACTIVITIES PROVIDED THROUGH EACH OF EIGHT TYPES OF ADMINISTRATIVE INFRASTRUCTURE

Rating Scale: 0 = opportunity very unlikely
1 = opportunity minimal
2 = reasonable opportunity
3 = maximum opportunity

There remains a final consideration with regard to infrastructure. That is the somewhat controversial question of formal training leading to a recognised qualification such as a Diploma in Tertiary Teaching. Such programs do have a role and they have been successfully introduced by several universities in many countries. Most are offered concurrently with employment. Their impact, however, is marginal as they are of interest only to a small proportion of university staff. To many, they represent a first step towards compulsory training, and this is an issue of major controversy and industrial concern on most campuses. This aspect is not further pursued as it requires an indepth discussion not possible within the scope of the present paper.

5. The Optimal Model for an Administrative Infrastructure — An independent Center for University Education

Provided there are sufficient resources, and other factors are favourable, such as climate of acceptance, and attitudes and values of the administration, the optimal model for the administration of a staff development program would appear to be the independently administered Center for the Improvement of Teaching and Learning. This model, however, may be costly, and availability of finances could be a limiting factor, both in regard to initial establishment and in terms of the range of responsibilities that may be assigned and developed. There is, however, a possible solution to this financial aspect and this is discussed below.

Programs for training the staff in teaching procedures can be greatly enhanced if a Center for the Improvement of Teaching and Learning also accepts responsibility for other related functions. It could thus be perceived as a broadly based University Education Center. The full range of activities for a University Education Center could be in four categories as follows:—

- audio-visual technology
- staff training, including organizational development programs
- continuing education of teachers for the general community
- research into the processes of teaching and learning.

Of these categories, audio-visual technology is probably the most critical in getting a Center established and accepted. A-V could have two roles. The first could be to provide a projection, video and audio service for all teaching presentations requiring such a service, together with provision for copying services for 'one-off' resources such as slides, overhead transparencies and work as a co-operative member of a three-way team, involving technical staff and academics. (See Figure 7).

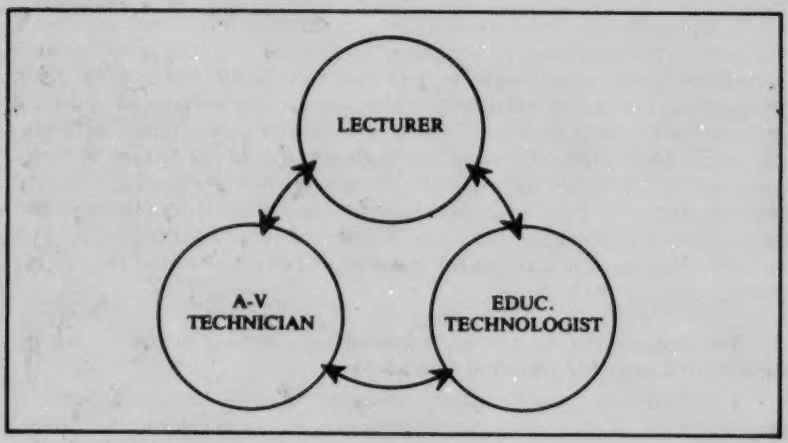


FIGURE 7

A three-way team is needed for the production of high-quality learning resources. The lecturer provides the content and academic criteria; the educational technologist provides skills of design and applies educational criteria and the A-V technician provides manufacturing skills and the criteria of technical excellence.

Such a Unit usually gains ready acceptance because it provides a useful and immediately visible service. It is also totally non-threatening, assuming of course, there are sufficient initial funds for it to be reasonably non-competitive in relation to the university budget. A-V units administered in association with a staff training program have major implications for the improvement of the quality of teaching and learning, largely through exploration and implementation of alternative strategies and methods. An Audio-visual system becomes a stimulus for change. At Macquarie University, (Sydney, Australia) for example, it became necessary to produce rapid and inexpensive copies of routine lectures given to internal students for distribution to external students taking degrees by correspondence. It was decided to develop an audio-recording and distribution service to meet this need. It rapidly followed that the audio system, established for one particular purpose, stimulated exploration of alternative uses of the system and many innovations followed (see figure 8).

Similar innovations can and do follow from the introduction of facilities for photography, video systems, and graphic art, including resources for production of overhead projector transparencies and for film making.

On the question of continuing education for the educational profession in the community at large, it is a relatively simple step to extend at least some of the internal staff training activities to outside agencies and individuals. This has the double advantage of providing an opportunity for university staff to learn from teachers and trainers from other institutions and also builds a favourable public relations and community service image for the university. This aspect could then be further expanded through the provision

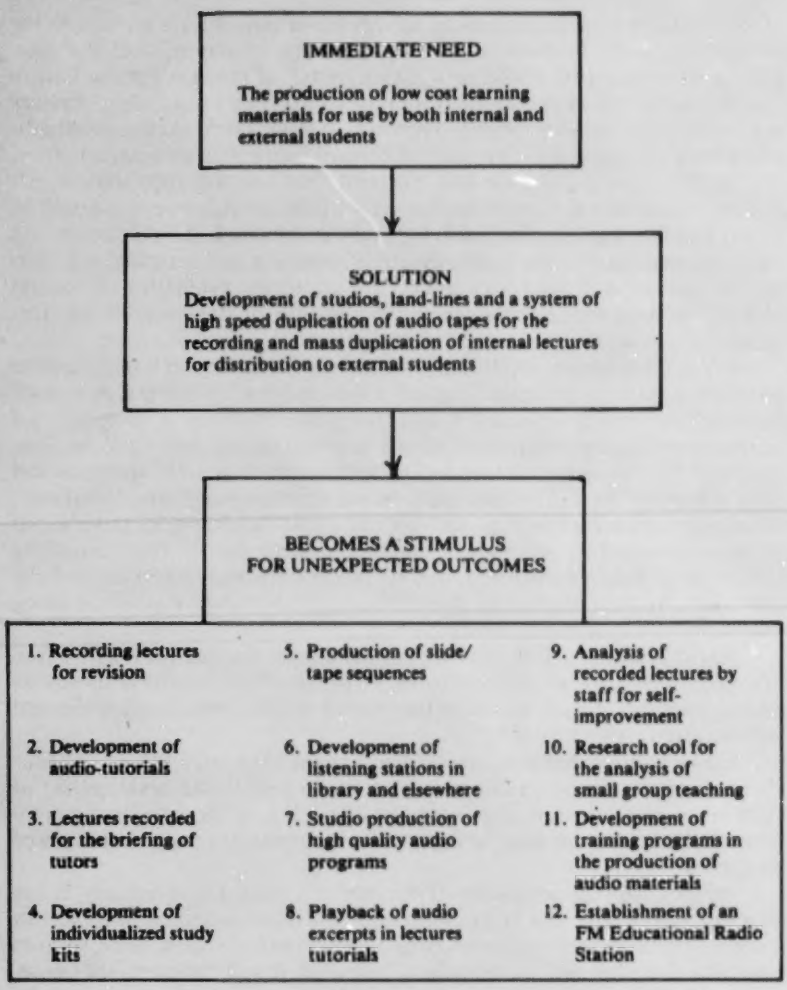

IMMEDIATE NEED
The production of low cost learning materials for use by both internal and external students
SOLUTION
Development of studios, land-lines and a system of high speed duplication of audio tapes for the recording and mass duplication of internal lectures for distribution to external students
BECOMES A STIMULUS FOR UNEXPECTED OUTCOMES
1. Recording lectures for revision
2. Development of audio-tutorials
3. Lectures recorded for the briefing of tutors
4. Development of individualized study kits
5. Production of slide/ tape sequences
6. Development of listening stations in library and elsewhere
7. Studio production of high quality audio programs
8. Playback of audio excerpts in lectures tutorials
9. Analysis of recorded lectures by staff for self-improvement
10. Research tool for the analysis of small group teaching
11. Development of training programs in the production of audio materials
12. Establishment of an FM Educational Radio Station

FIGURE 8

One development in the audio-visual area can lead to a wide range of unforseen innovative outcomes. In this case, Macquarie University introduced audio systems to meet a specific need for tuition of external students and this, in turn, stimulated a wide-ranging application of audio systems in teaching and learning.

of visitors programs, secondments, advisory and consultative services to the community, issue of publications, a document exchange, and the like. Ultimately, this aspect could be a major source of revenue for the Centre through the provision of fee paying training courses and by the sale of services and resources to the educational community at large. Such revenue could subsidise and perhaps, eventually, meet all costs of internal on-campus activities.

Within the university context, the need for a research capability is self-evident. Research by a Center for University Education, however, should be action-based and developmental in focus and emphasis. It should concentrate on issues that lead to the improvement of teaching and learning, e.g. formative evaluation of resources and of new strategies; evaluation of courses and of teaching processes; systematic collection of data needed for formulation of new policies in regard to teaching and learning; and so on.

In planning for a new Center for University Education, it is important to establish at once, the basic staffing and resources for all four areas; A-V; staff training; continuing education and research. Perhaps a Director (of professorial status) could co-ordinate and supervise the work of four Assistant Directors, each in turn having appropriate academic, technical and clerical support staff. The four areas should develop evenly and in balance. There is grave danger that, say, the A-V unit could develop more rapidly, out of proportion to other sub-units. If that should occur then the functions of the Center could become distorted, and its image both within and beyond the university, become fixed as an A-V Unit only with non-A-V activities being inhibited.

As the Center develops there is a further danger that each of the four sub-units may diverge in function and form. To obtain the maximum cost benefits all four elements should be seen to become more and more closely integrated and interactive. (See Figure 9).

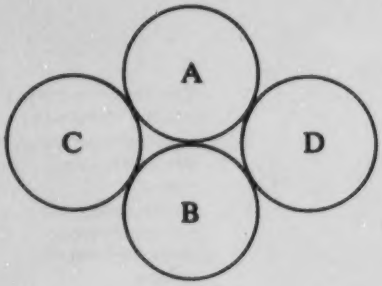
Figure 9 shows that with careful planning the close integration of all four elements of a University Education Center can lead to the development of fully interactive functions that would be difficult to achieve without a common administration, at least during the developmental stages of the history of the Center.

Initially the implementation of this type of infrastructure is costly, but as integration proceeds, and as the continuing education and community service activities become more sophisticated and earn revenue for the Center, so costs per unit activity fall and cost benefits accrue until, if well managed, the Center can become virtually self-supporting. Then, and only then, might it be possible for form to follow function, and for the sub-units to become administratively independent. Even then, however, they would need to work together in close co-operation in all aspects of their programs.

6. The Special Role of Educational Technology in Staff Training

This paper has reviewed staff training models and has considered a range of activities for the improvement of Teaching and Learning in universities. Some attention has been given to realizing in these activities the optimal conditions leading to effective learning. In this final section the special role of educational technology is considered.

STAGE I — BASIC ELEMENTS — NON INTERACTIVE



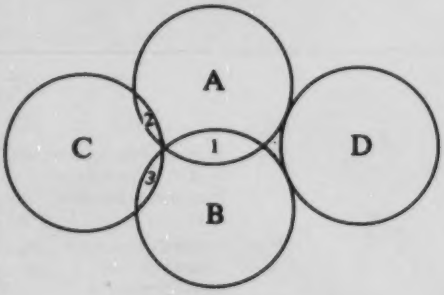
A = Audio-visual technology

B = Staff training

C = Continuing education

D = Research

STAGE II — FIRST INTERACTION PHASE

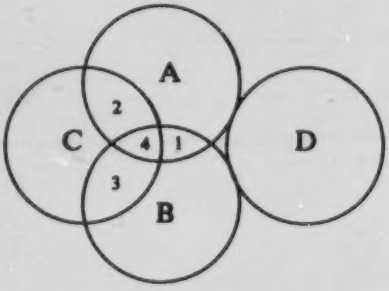


1 = Production of learning resources

2 = A-V service for the continuing education activities of the Center

3 = Activities common to the continuing education land staff development programs

STAGE III — SECOND INTERACTION PHASE

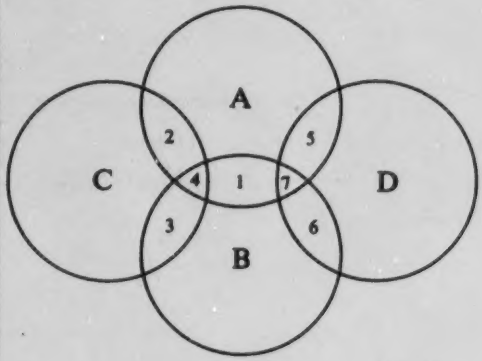


4 = Application of A-V technology to staff training programs

FIGURE 9

Stages in the developing interactions between functional elements of a University Education Center
Stage I to II

STAGE IV — THIRD INTERACTIVE PHASE

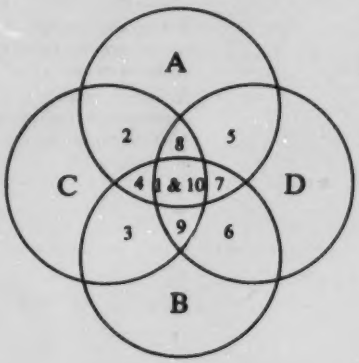


5 = Developmental research into A-V technology

6 = Developmental research into staff training programs

7 = Developmental research into applications of A-V technology to staff training

STAGE V — FOURTH INTERACTIVE PHASE



8 = Research into applications of A-V technology to continuing education activities

9 = Research into factors common to staff development and continuing education

10 = Research into the overall program of the Center

FIGURE 9 (Cont'd)

Stages in the developing interaction between functional elements of a University Education Center
Stages IV and V

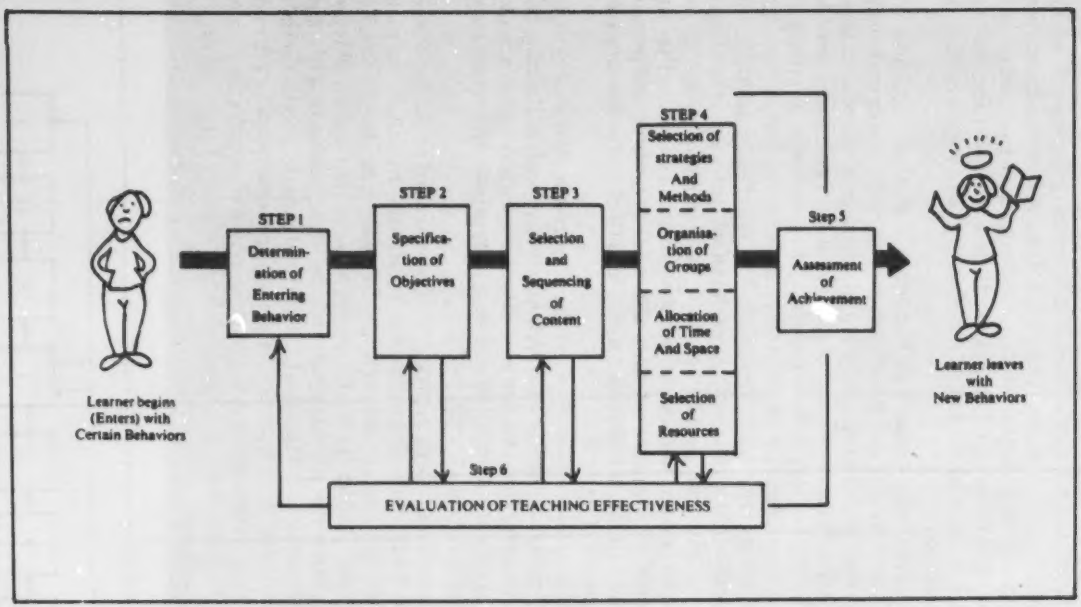


FIGURE 10

The systems approach adopted by the Center for Advancement of Teaching, Macquarie University. This approach is used as a basis for the design and presentation of training activities and of continuing education programs. Modified versions of the approach are used in the production of resources and as the basis of certain aspects of research and development.

By educational technology is meant a systematic approach to the processes of Teaching and Learning. This usually involves clear specifications of aims and objectives and careful selection and sequencing of content and strategies for the achievement of objectives. It includes provisions for accurate assessment of the achievement of the objectives and for an evaluation of overall effectiveness.

This type of approach is especially important in staff development for several reasons. One reason is that most individual activities involve relatively short encounters that must be integrated into the busy professional schedule of members of staff. The purpose and objectives of each encounter must be clear and the objectives must be attainable. A systematic approach is therefore required. A second reason, and this is related to the first, is that staff development programs must have credibility. The systematic, scientific application of educational principles as exemplified through educational technology, has intellectual appeal to many academics in a variety of disciplines. A third reason, and this is perhaps the main point, is that the educational technology approach provides a basis for organizing and presenting activities which optimize conditions which lead to effective learning (see Section 2 and especially Figure 3).

As Macquarie University in Sydney, the Center for Advancement of Teaching (CAT) utilizes an educational technology approach as the basis for its training programs; for the production of educational resources; as a model for its continuing education activities and as one approach to research and development (see Figure 10). (Meyer, 1979).

An educational technology approach can be extended to the individual strategies and methods of training within a given activity. In C.A.T. the main training is through minicourses and these involve an application of a series of miniature "systems" in the form of input-process-output cycles. (Meyer, 1979). A simple example of a single cycle could be the screening of a film (input), followed by discussion of the film (process) and then the production of a critical review (output). Within any activity, input-process-output cycles are linked linearly, each output leading to the input phase of the next cycle and feeding back to the input phase of its own cycle (see Figure 11. I = input, P = process, O = output).

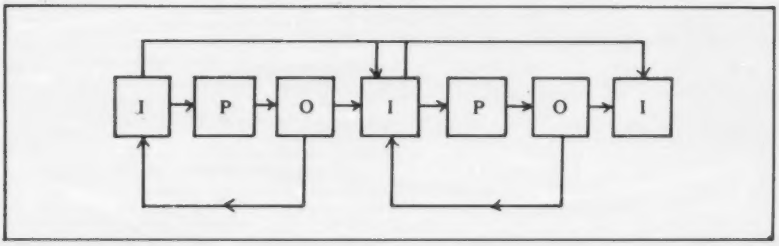


FIGURE 11

The input-process-output cycles of a C.A.T. staff training activity. (Meyer, 1979).

This approach gives maximum opportunity for the application of techniques of behavioral psychology. Each input and/or process phase can be regarded as a stimulus and the output as a response. It is therefore relatively easy to break learning into the small stimulus-response steps required by the behaviorist and to provide reinforcement through success at each response phase.

In conclusion, therefore, not only should staff development activities be based on optimal infrastructure, they should also be highly systematic in design and presentation. Only then will staff development attain the credibility necessary to overcome the many factors operating within the university world to prevent its universal acceptance and adoption.

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EDUCATIONAL TECHNOLOGY FOR THE HELP OF CONDUCTING BETTER INSTRUCTION

by
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Introduction

In Japan, the author can say that there is no university which has a good supportive infrastructure or educational service center. Yes — we have many centers, more than 25, for educational technology (E.T.) in each department of education in National Universities, but the real activities of those centers seem to be inclined towards research work, that is, they have no service work to their schools.

Very few centers are, however, offering special lectures on E.T. to the students and their staff in order to promote their sense of E.T. So the author has surveyed the curriculum of their courses on E.T. which are now conducted in each school sponsored by those centers themselves or Department of Education as shown in Appendix I.

As the definition of E.T. has not yet been decided officially among all our researchers and teachers, it seems that there are many variations in its construction of the courses and contents as shown in the table mentioned above.

It is, however, very interesting for the author that there is no description that they are hardware oriented. The author thinks this is a very important matter because of the reason mentioned below.

In the educational field of not only Japan but also all over the world, it seems that there are two different kinds of attitudes toward "Educational Technology." One is to oppose it thoughtlessly, that is, an atmosphere prevails against the innovative movement to advance systematization and to increase efficiency among teachers in schools and researchers in institutions; and the other is to believe in it blindly; while someone else may consider E.T. as just introducing any kinds of teaching machines into classrooms, or someone may say that E.T. is just to write a teaching schedule (course outline) in the form of "flowchart", or someone thinks that the research work on E.T. is in only researching the CAI (Computer Assisted Instruction) especially looking at its hardware. The author, however, thinks that the above ideas are not true.

The author knows the merits of flowcharts, some teaching machines and CAI, but he does consider it is too early to introduce those ideas and media into the educational field, before all teachers and researchers can understand the real concept of E.T.

Ask "What is Technology?", before asking what Educational Technology is.

Technology can be considered to be one part of "Science" to realize one's purpose. In Technology, it is very important to take the following five steps.

1. To set up the purpose clearly and distinctly,
2. To think out several ways so as to accomplish the purpose,
3. To pick up the most suitable way among the above ways under careful considerations, taking their surroundings into account,
4. To carry out effectively the way picked up,
5. To feed back the evaluation of results and to improve the four steps mentioned above.

We, technologists, should always consider the above five steps. In this sense, Educational Technology is considered to be one of the technologies to help bring about a realization of real education. Because, veteran researchers in E.T. and teachers in schools do always consider these five steps: purpose, its ways, choosing, practicing, and evaluation and feedback.

"Systems Concept" of Educational Technology

In order to understand the real meaning of Educational Technology, we should consider one more important concept, that is Educational System.

It is considered that Educational Technology may be in the category of Human Engineering (H.E.) and it occupies the main part of H.E. From the system engineering's point of view, Human Engineering is strongly concerned with

man to man system or
man to machine system.

On the contrary, other kinds of Engineering except Human Engineering, such as Mechanical Engineering, Electrical Engineering, Computer Science and so on....., are concerned with

machine to machine system or
man to machine system.

Therefore, we should understand that the Educational Technology is based on human beings all the way, as shown in Table 1.

TABLE 1

TYPES OF SYSTEM OF TECHNOLOGY

(A) MACHINE TO MACHINE SYSTEM
(B) MAN TO MACHINE SYSTEM
(C) MAN TO MAN SYSTEM

MECHANICAL ENGINEERING	(A)	Engine with less EXHAUSTED GAS
	(B)	Steering wheel with easy HANDLING
ELECTRICAL ENGINEERING	(A)	Transistor with better characteristics
	(B)	T.V. set which is easy to watch
COMPUTER ENGINEERING	(A)	Computer having less computation time
	(B)	Computer having easy communication capability with human being
CHEMICAL ENGINEERING	(A)	Strong textile against heat
	(B)	Textile with good skin feeling for babies
SOCIAL ENGINEERING	(B)	Utility of Motor-car and its hazard
	(C)	Mob psychology
EDUCATIONAL TECHNOLOGY	(B)	More effective information transferring system
	(C)	Teaching/learning system and its process

By the way, once a human being is introduced into the educational system, its system becomes very complicated in its performance, even if the system were simple in its construction. Because a human being is very complicated. For example, when you admire a student, he may study hard because he is being encouraged by the teacher's words. On the other hand he may not study hard because of being puffed up with the praise. And when you scold him severely, he may be utterly depressed and does not wish to study hard, or alternatively he may be motivated by a teacher's scolding. These unexpected psychological features of human beings make the system very complicated.

Therefore, we, educational technologists, should always consider the "human aspect" or "human relationship"; but unfortunately we often forget its importance.

For example, however good the performance of a lecturer may be, he will find it hard to keep his students' attention constantly focused on his lecture. Therefore, it is very important for the lecturer to make his course outline better with excellent strategies and tactics, that is,

Have dramatic scenarios,
Use words of praise and encouragement,
Insert interesting episode and cheerful and witty jokes,
Add proper illustration on blackboards or screens for OHPs,
Use a pointer at the proper position on the board,
Use "Cue-techniques" in his lecture, (that is, teachers should get a good hint from the performance of magicians).

Impression never comes out
From only the Violin (Hardware),
It comes from also Program (Software)
And Technique (Useware: The Way of use)
The most important is
The Harmonized Combination of the Three.

FIGURE 1

THE BASIC IDEA OF EDUCATIONAL TECHNOLOGY

Harmonized Combination of Hardware, Software and Useware

— Attach great importance to the sense of balance —

The author understands that both good HARDWARE and SOFTWARE have a very important place in Educational Technology. In addition, USEWARE, in other words, how to use them is very important too.

The author thinks that the most important thing in E.T. is the harmonized and balanced combination of these three WARES. (see Fig. 1).

For example, the most important point in CAI is not in the hardware but in the software and in the useware, that is, we know that it takes two years in order to make a good courseware for CAI with two veteran teachers writing a scenario and making many tryouts of it.

In CAI system, the price of computer has come down year by year, but the cost of the interfaces and the equipment for display is still high. So the author and his group have developed a new CAI system utilizing the windmill machines.[1]

In this system, the cost of mini-computer and the cost of windmills as display-equipment come to a balance. Thus, the word "balance" is also a very important matter in the way of technological thinking. (see Appendix 2)

In the case of making instructional video materials, as another example, it seems there is a fashion in which they want to use a highly equipped video studio similar to one of a broadcast corporation. But we can make good educational video materials by the use of a very simple video system, equipped with one VTR, one camera, one monitor and one microphone. In this modern age we can use a simple but fine VTR system with electronic, and hence we can now get a balanced video studies as we understand it. (see Fig. 2).

Need for Creativity and Flexibility of Teachers

The author feels that there is a curious tendency in the educational field, that teachers merely want to use expensive teaching aids, machines and equipment regardless of their situations and surroundings.

Therefore, we should look for simple and effective educational materials that are appropriate, because simple materials are low cost in themselves and easy to get. So we need the creativity and flexibility of teachers in this case.

For example, there is a kind of teaching machine called Response Analyzer. This is an electrical machine for totalling students' responses and which enables the teacher to grasp immediately and exactly learners' reactions to the teacher by having each learner's response to the teacher's questions by pushing switches.

The author and his group investigated the problems of the traditional response analyzers which were very expensive due to intricate circuits, and they developed the portable analyzer having a function of minimum necessity, which is composed of 48 two-choice switches, a totaling electric meter, and the optional transparent electric meter. The size and portability of

FIGURE 2
A HIGHLY EQUIPPED VIDEO STUDIO
VS.
A SIMPLIFIED VIDEO SYSTEM

this machine is very compact and its price is the cheapest in the world ($250). The machine was named "Minilyzer" by the author, because it was designed so as to satisfy the minimum essential requirements as an ordinary response analyzer.[2]

As another example, the introduction of overhead projectors into classrooms is highly recommended by the author, because it is simple in construction, easy to handle and also its price is reasonable.

There are many ways of using an OHP, i.e. not only in presenting transparent visuals, but also in showing simple shadow demonstrations of experiments.

(The author will show the audience some demonstrations of basic electrical circuits which were made in the CRADLE at the time of his talk at the conference.)

As to educational strategy, teachers also should create new educational strategies and tactics in order to motivate the students in their classes. One example is Yalkeys System developed in CRADLE.[3]

Conclusion

The most important point of increasing such activities in the educational field is to cultivate the creativity and flexibility of teachers and their staff, which will enable them to adopt many good strategies and tactics in their classrooms, and to produce many good effective teaching materials by utilizing various materials which would be close to teachers and staffs around.

In teacher education, therefore, we should seriously consider cultivating creativity, flexibility and also technological sense in the students who will become teachers, and staff to assist them in their instruction. Therefore, the course of Educational Technology should be opened to the students and staff in each university.[4,5]

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PROGRAMS
in the course on
EDUCATIONAL TECHNOLOGY
being held in each university in Japan

(1) KEIO UNIVERSITY

(1-1) Educational Information Technology

by H. FUJITA

This course is the educational methodology for general engineers and also a guide to proper edcational technology for teachers as well.

The purpose is to improve education, having another look at it from the view point of information technology. These people such as professors and assistants in universities, researchers in enterprises who have to lead their juniors, and also the general public who is interested in the education of his children become the object of this course.

The lecturer wishes to create this course with students together through full discussion and seminar.

(1-2) Advanced Course No. 2

"Technical Presentation"

by T. YAMAZAKI *et. al.*

How can we communicate rightly what we want to inform without much difficulties between speakers and listeners? The purpose of this course is to train our communication techniques through the actual discussions and writing, especially focussing upon the view point of educational technology. The course will be conducted by several lecturers, especially including a foreigner.

(2) The Program of the Course on
"Educational Technology"
in the first trial lecture series
in the Open University of Japan
through radio-broadcasting
JAPAN Short Wave Broadcasting Corporation

by K. SUETAKE, A. SAKAMOTO, M. NISHIMAKI, *et al.*

1.	Education in the Technological Point of View	K. Suetake
2.	Teaching and Learning System	A. Sakamoto
3.	Principles of Transferring Information and Its Techniques	K. Suetake
4.	Equipments for Instruction	K. Suetake
5.	Teaching-Learning Program (1)	A. Sakamoto
6.	Mechanization of Educational Feedback	K. Suetake
7.	Utilization of Electronics to Education (CCTV and VTR)	K. Suetake
8.	Utilization of Electronics to Education (Acoustic Equipment)	M. Nishimaki
9.	Teaching Machines (1) — their hardware and software —	K. Suetake
10.	Utilization of Computers into Education	K. Suetake, A. Sakamoto

11.	Teaching Machines (2) — examples and how to use —	K. Suetake
12.	Development of Discovery-Learning and Creativity	A. Sakamoto
13.	Teaching-Learning Program (2) — evaluation of practice —	A. Sakamoto
14.	Systematization of Instruction	A. Sakamoto
15.	Systematization of Education and Educational Service Centers	K. Suetake, A. Sakamoto, H. Ooba

(3) OKAYAMA UNIVERSITY

Educational Technology

by I. KONDO

1. The orientation for the course. (What is Educational Technology?)
2—4. Basic idea of educational tools, devices and equipments utilizing electrical and engineering, and their use.
5—6. How to use teaching machines effectively (OHP, Slide Projector, 8/16 mm Film Projector, etc.)
7—8. How to observe the teaching-learning process by showing video-taped class activities and how to design the courseware.
9 The comparison of the performances of a veteran teacher and a green teacher by the use of two large video projectors.
10. Observation of real class-activities conducted by a veteran teacher through the CCTV system.
11. Designing a teaching plan, and preparing educational materials which are necessary to the plan.
12—15. Performing microteaching with the plan and the materials prepared in item (11).

(4) TOKYO INSTITUTE OF TECHNOLOGY

(4—1) GRADUATE COURSE

Advanced Educational Technology

by K. SUETAKE, A. SAKAMOTO

The principle and methodology of educational technology will be discussed.

Content:
1. how to take the point of education in technological sense,
2. teaching-learning systems and process,
3. principle and methodology for transferring information,
4. utilization of machines for transferring (image) information,
5. learning programming,
6. feedback mechanism in teaching-learning system.
7. utilization of electronic techniques for education,
8. teaching materials and teaching machines,
9. utilization of computer for education,
10. development of discovery-learning system, and creativity,
11. systematization of instruction,
12. systematization of education.

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(4—2) UNDER GRADUATE COURSE

Educational Technology

by K. SUETAKE, A. OOMURA, *et al.*

I The purpose of this course is to make understand the methodology and effect of Educational Technology.

II. In the teaching-learning process the following items will be discussed: the psychological basis of educational technology, the way of designing of course outline, and the techniques of evaluation. Principles of audio-visual techniques will be discussed from the view point of educational technology.

1.	Outline of Educational Technology	K. Suetake
2.	Principle and Methodology for Transferring Information	K. Suetake
3.	How to use OHP	K. Suetake
4.	How to use VTR	K. Suetake
5.	Application of Computer into Education	Y. Shimizu
6.	Educational Environment	Y. Shimizu
7.	Optimization of Teaching-Learning System	A. Oomura
8.	Teaching Machines 1	K. Suetake
9.	Teaching Machines 2	K. Suetake
10.	Evaluation and Testing Technique 1	H. Ikeda
11.	Evaluation and Testing Technique 2	H. Ikeda
12.	Micro-Teaching	A. Oomura
13.	Educational Management Engineering	K. Arai
14.	Systematization of Education	K. Suetake

The 1976 Asian Regional Training Course on E.T. Sponsored by UNESCO

PROGRAM OF TRAINING COURSE IN THE CRADLE, TOKYO INSTITUTE OF TECHNOLOGY

	9:00—10:20	10:40—12:00	Lunch Time	13:00—14:50	15:10—16:30	
Aug. 23 Mon.	Orientation Lecture: "Minilyzer" (K. Suetake)	Explanation on Practice (Suetake) Introduction to "Windmill" (A)		Practice "Windmill", "Magnetic Sheet" and "Talking Cards" (B)		
Aug. 24 Tue.	Lecture and Practice: Analysis of Teaching-Learning Processes (T. Sakamoto)			Lecture and Practice: Analysis of Teaching-Learning Processes (Continued) (T. Sakamoto)	Practice: "Touch and Play" (C)	
Aug. 25 Wed.	Lecture and Practice: Microteaching (T. Sakamoto)			Practice: Microteaching (T. Sakamoto)	Practice: T.M. for Pattern Recognition (D)	
Aug. 26 Thu.	Lecture: Prose learning and cognitive structure (A. Omura)	Visit to the CRADLE (E)		Practice: Teaching Machines for Pattern Recognition (Continued) (D)		
Aug. 27 Fri.	Lecture: Fundamental ideas of AV techniques (How to use OHP effectively) (K. Suetake) ((S.T.))			Lecture: Nature of feedback in Teaching Learning Processes (T. Sakamoto) ((S.T.))		Farewell Party

(A) K. Suetake, T. Sonoya
(B) K. Suetake, Y. Shimizu, T. Sonoya
(C) N. Osumi, C. Sakaguchi
(D) K. Suetake, C. Sakaguchi
(E) Y. Shimizu, I. Kitagaki, C. Sakaguchi
((S.T.)) Simultaneous Translation

APPENDIX 2

INSTRUCTION MANAGEMENT SYSTEM

— A simplified CMI utilizing a real time graphic display to show individual and whole class studying steps —

by K. SUETAKE *et al*

The system is to give a teacher the educational informaltion on individual learning condition of students in his class who are studying a course of programmed instruction by the use of individual simple teaching machine (WINDMILL).[2] By this system, the teacher can conduct the students skillfully.

The system consists of 40 or more WINDMILLS, microprocessors, a CRT display and other accessories. The informations of each teaching machine are collected to the microprocessor, processed, and finally shown on a CRT display.

The teacher can easily recognize the studying pace of the individual students and also the whole class situation carried by this system by only handling the wireless operation box. The system is so designed that the collected data and the calculated results can be stored into a magnetic cassette tape and then can be used afterward. During the system is working, what the teacher watched can be stored as well.

By using this system, it becomes easier to make the teacher improve his way of individual guidance of his students and to evaluate the courseware of programmed instruction under use mounted to WINDMILL. Also, from the data collected, we can analyze the teaching-learning process in the class. The system can be considered as the cheapest CAI in the world.

BACKGROUND PAPERS

1. THE ROLE OF AN INSTRUCTIONAL DEVELOPMENT UNIT IN IMPROVING UNIVERSITY TEACHING AND LEARNING

by

Dr. Ronald F. Turner-Smith
The Chinese University of Hongkong

2. ACADEMIC STAFF DEVELOPMENT IN AUSTRALIA

by

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